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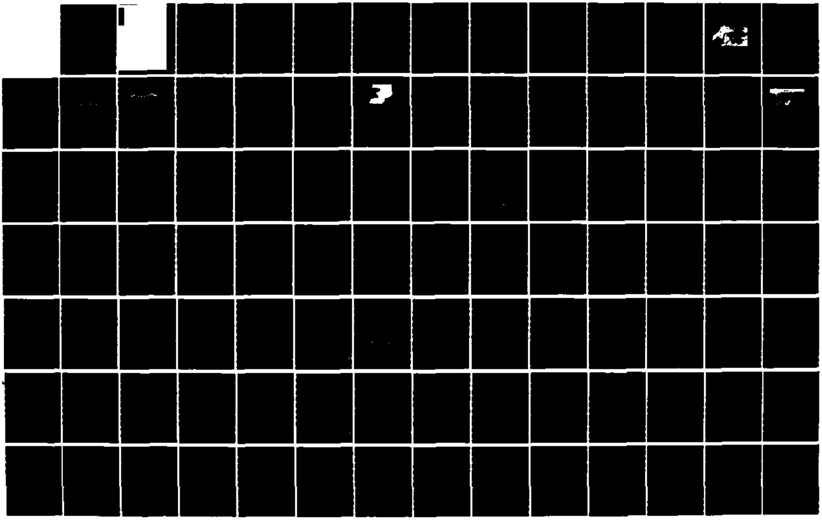

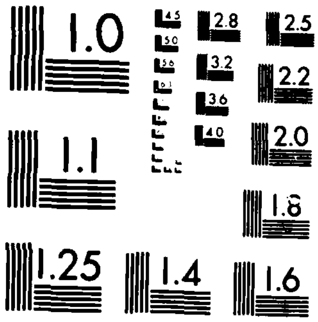

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A one-dimensional model (CE-QUAL-R1) of water quality for reservoirs was evaluated using data collected on the Eau Galle Reservoir, in west-central Wisconsin. Data collected in 1981 were used for calibration; data collected in 1982 were used for confirmation. Graphical and statistical comparisons were made for over 6,500 samples representing 21 variables. The statistical test used for comparing measured versus predicted values was the Reliability

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20. ABSTRACT (Continued).

Index (RI). The average RI for each variable indicated that precision was always better than a half-order of magnitude, even for variables that ranged over more than three orders of magnitude. Graphs are presented for all variables, including profiles for the date with the poorest predictions (according to the RI). In addition, comparisons of measured and predicted flux values were satisfactory, helping to ensure that reasonable predictions were made for the correct reasons.

PREFACE

This report was sponsored by the Office, Chief of Engineers (OCE), US Army, as part of the Environmental and Water Quality Operational Studies (EWQOS), Work Units IB.1 and IC.1. OCE Technical Monitors for EWQOS were Dr. John Bushman, Mr. Earl Eiker, and Mr. James L. Gottesman.

Confirmation of CE-QUAL-R1 using data from Eau Galle Reservoir and the writing of this report were accomplished by Dr. Joseph H. Wlosinski and Dr. Carol D. Collins, Water Quality Modeling Group (WQMG), Ecosystem Research and Simulation Division (ERSD), of the Environmental Laboratory (EL), US Army Engineer Waterways Experiment Station (WES). Total confirmation, other model development, and data collection and manipulation were performed by many other members of the ERSD during the course of EWQOS. The draft report was reviewed by Dr. James L. Martin and Dr. Stephen P. Schreiner, both of the WQMG. The report was edited by Ms. Jessica S. Ruff of the WES Publications and Graphic Arts Division.

The study was conducted under the direct supervision of Mr. Mark S. Dortch, Chief, WQMG, and under the general supervision of Mr. Donald L. Robey, Chief, ERSD, and Dr. John Harrison, Chief, EL, WES. Program Manager of EWQOS was Dr. Jerome L. Mahloch, EL.

During the study and preparation of this report, COL Tilford C. Creel, CE, and COL Robert C. Lee, CE, were Commanders and Directors of WES and Mr. Fred R. Brown was Technical Director. At the time of publication, COL Allen F. Grum, USA, was Director and Dr. Robert W. Whalin was Technical Director.

This report should be cited as follows:

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CONTENTS

CONFIRMATION OF THE WATER QUALITY MODEL CE-QUAL-R1 USING DATA FROM EAU GALLE RESERVOIR, WISCONSIN

PART I: INTRODUCTION

Background

1. CE-QUAL-R1 is a water quality model that is undergoing continuing development by the Corps of Engineers as part of the Environmental and Water Quality Operational Studies (EWQOS). The model predicts the vertical distribution of temperature and other water quality variables in a reservoir through time. The version of the model used for this study was basically the one described in the revised User's Manual (Environmental Laboratory 1982), with changes as reported in Wlosinski and Collins 1985. In addition, a weir subroutine and a macrophyte subroutine were added to the model to better simulate conditions of the Eau Galle Reservoir. All work was done on a VAX-11-750 computer.

2. Model confirmation using data collected on the Eau Galle Reservoir follows a similar study using data collected on DeGray Lake, a Corps of Engineers project located in the Ouachita Mountains in south-central Arkansas (Wlosinski and Collins 1985). One purpose of the two studies was to test the model on reservoirs that differed markedly. DeGray Lake is 32 km long, dendritic, and has a normal depth near 57 m, an area of 5.3×10^7 m^2, and a volume of 7.9×10^8 m^3. Eau Galle Reservoir is 1 km long, circular, and has a normal depth near 10 m, an area of 4.5×10^5 m^2, and a volume of 1.7×10^6 m^3. DeGray is monomictic, while Eau Galle is dimictic. Biologically, Eau Galle is much more productive than DeGray.

Purpose

3. The purpose of this study was to ensure that model performance is suitable for the needs of Corps of Engineers (CE) District and

Division Offices. This was accomplished by comparing model predictions to field measured values. Data collected in 1981 were used for model calibration, while data collected in 1982 were used for confirmation. Graphical and statistical tests were used for the comparisons, which consisted of the concentrations of state variables. In addition, the flux between modeled components was compared in cases where data were available.

Model Description

4. CE-QUAL-R1 is a water quality model that computes the vertical distribution of 37 physical, biological, and chemical constituents in a reservoir through time. In the model, a reservoir is conceptualized as a vertical series of horizontal layers where thermal energy and mass are uniformly distributed in each layer. The horizontal layer thicknesses are variable and dependent on the balance of inflowing and outflowing waters. Variable layer thicknesses permit accurate mass balancing and reduce numerical dispersion during periods of large inflow and outflow.

5. Inflowing waters are distributed vertically based on density differences, so that simulations of surface flows, interflows, and underflows are possible. Water density is dependent on temperature and dissolved and suspended solids concentrations. Outflowing waters are withdrawn from the horizontal layers considering density stratification using the selective withdrawal algorithm of Bohan and Grace (1973). Reservoir outflows, by port, can either be specified or the user can invoke a subroutine that will choose port flows in order to meet a downstream temperature objective.

6. The heat budget includes the components of short- and long-wave radiation, back radiation, reflected solar and atmospheric radiation, evaporative loss, conductive heat transfers, and gain or loss through inflows and outflows. Vertical transport of thermal energy and mass is achieved through entrainment and turbulent diffusion. Entrainment determines the depth of the upper mixed layer and the onset of stratification. It is calculated from the turbulent kinetic energy

influx generated by wind shear and convective mixing using an integral energy approach (Johnson and Ford 1981). Turbulent diffusion tends to reduce gradients and is incorporated using a turbulent or eddy diffusion coefficient that is dependent on the windspeed, magnitude of inflows and outflows, and density stratification.

7. The prediction of water quality is based upon simulation of the interaction of numerous biological and chemical constituents. Forces that directly affect the simulation of these constituents are temperature, irradiation, wind speed, inflow and outflow rates, and inflowing and outflowing masses. The physical distribution of mass is dependent upon the diffusive and convective processes described above and on settling processes.

8. The interactions between and among the constituents ultimately determine the constituent masses. Photosynthesis, dark respiration, photorespiration, and nonpredatory mortality are processes influencing algal and macrophyte mass. Grazing by fish and zooplankton are additional influences on algae. Ingestion, egestion, and respiration affect zooplankton and fish growth. Inorganic compounds such as ammonia-N, nitrite plus nitrate-N, orthophosphate, and silica are consumed and produced as a result of the photosynthetic and respiratory processes of the plants and animals. Orthophosphate and ammonia-N are adsorbed to solids according to a modified equation for the Langmuir isotherm. Ammonia-N is also removed by conversion to nitrite plus nitrate-N under aerobic conditions. Nitrite plus nitrate-N is lost through denitrification.

9. Mass of detritus is dependent on algal and macrophyte mortality, ingestion by fish and zooplankton, egestion of zooplankton, and settling. Decomposition of detritus contributes mass to ammonia-N, nitrite plus nitrate-N, orthophosphate, and inorganic carbon.

10. Inflowing and initial concentrations for dissolved organic matter (DOM) are fractionized between labile and refractory DOM compartments. Refractory DOM is usually more resistant to decomposition than labile DOM and decomposes at a slower rate. Plant photorespiration contributes to labile DOM. As labile DOM decomposes, products are

distributed to inorganic nutrients and refractory DOM.

11. Dissolved oxygen concentration is of primary importance to reservoir management. Oxygen is evolved by algal and macrophyte photosynthesis. Oxygen demand in CE-QUAL-R1 is created by the processes of nitrification, decomposition of organic compounds and sediment, respiration, and oxidation of reduced products of anaerobic reactions. Oxygen may also be gained or lost at the air-water interface. Anaerobic and aerobic conditions resulting from changes in oxygen concentration drive many other modeled processes. If the system becomes anaerobic, decomposition of organic material slows considerably, and certain compounds are released from the sediment. These compounds include ammonia-N ($NH4^{+}$ -N), orthophosphate-P ($PO4^{-3}$ -P), dissolved reduced manganese and iron (Mn^{+2}, Fe^{+2}), and sulfide (S^{-2}). Sediments release almost all the anaerobic compounds generated in CE-QUAL-R1; reductions and inflow account for the remainder. Reoxygenation of the system will reverse these reactions.

12. Total dissolved solids are simulated to obtain an approximation of ionic strength. Calculations based on the equilibrium reactions of bicarbonate, carbonate, and hydroxyl ions and on ionic strength result in the pH value reported for each layer. This value is then used to calculate the carbon dioxide concentration which contributes to plant growth and diffuses across the air-water interface. Total alkalinity is simulated in CE-QUAL-R1 to provide an indication of the buffering capacity of the system. Alkalinity is modeled as a conservative substance, being only advected and diffused.

13. Suspended solids influence both the density and light regimes. Suspended solids are subjected to advection, diffusion, and settling. A more detailed description of the final model used in this study will be available in a revised user's manual.

Eau Galle Reservoir Study Site

14. Eau Galle Reservoir is located in west-central Wisconsin, 56 km upstream of the confluence of the Eau Galle and Chippewa Rivers

and immediately upstream of the town of Spring Valley. The drainage area at the damsite is 165 km^2, with the majority of the land being used for dairy operations and associated agriculture. At a normal pool elevation of 286.5 m mean sea level (1929 adjustment), the surface area of the pool is 0.5 km^2, the volume is 1.7×10^6 m^3, the maximum depth is 9.75 m, and the reservoir mean depth is 3.7 m. The dam is a rolled earth-fill structure, with a length of 486 m and a maximum height above the streambed of 37 m. Pool elevation is controlled by a vertical slide gate leading to a horseshoe conduit with an upstream invert elevation of 279.3 m and by an uncontrolled morning glory weir at 286.5 m. During 1982 and 1983, the pool fluctuated between 286.3 and 288.6 m although it rarely exceeded 286.8 m. A more detailed description of the dam, reservoir, and watershed is available in Ashby (1985).

15. An overview of the reservoir is presented in Figure 1. The dam is located in the top right corner of the figure. The in-pool sampling stations are labeled 10, 20, 30, 40, 50, and 60. The Eau Galle River and French Creek join just upstream of the reservoir, and enter at the point labeled A. Lousy and Lohn Creeks enter at B and C, respectively.

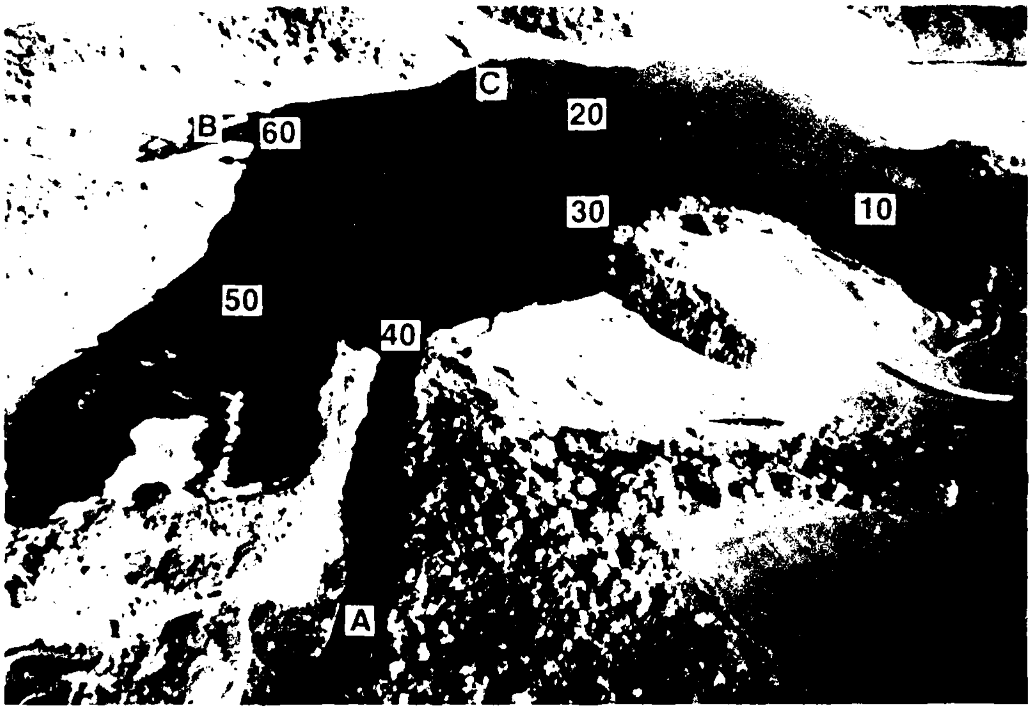

Figure 1. Overview of Eau Galle Reservoir (symbols are defined in text)

PART II: DATA REQUIREMENTS

16. Four types of data were required for the simulation studies: initial conditions, driving variables (also termed boundary conditions or updates), model coefficients, and confirmation data (also termed calibration or verification data). Initial conditions refer to the amounts of state variables at the start of simulation. Driving variables act to change the state variables of the system, but lie outside the system. For CE-QUAL-R1, the driving variables include meteorological data, flow from upstream, and controlled outflow releases. Model coefficients are constants used in the algorithms that comprise the model. Confirmation data refer to field measured values which are then compared to model predictions. Complete data sets are included in Appendix A for 1981 and for 1982. These data sets include only those data needed to simulate the Eau Galle Reservoir. Confirmation data are not included. Information on the sampling program and analytical methods can be found in Johnson and Lauer (1985).

Initial Conditions

17. Initial conditions were measured on 7 April 1981 and 20 April 1982 at the deepest part of the pool, located at station 20 (Figure 1). Those variables for which values were available were temperature, alkalinity, ammonia-N, nitrite plus nitrate-N, oxygen, orthophosphate-P, total dissolved solids, pH, suspended solids, silica, coliforms, sulfate, and sulfide. Reduced and oxidized manganese and iron were obtained from dissolved, and from the difference between total and dissolved, manganese and iron, respectively.

18. Initial conditions for algae were estimated using chlorophyll-a measurements and information from Barko et al. (1985). They found a significant relationship ($r^2 = 0.84$) of 2.8 mg chlorophyll-a per gram of fresh weight. Using this value, and the assumption that 90 percent of fresh weight is water, the conversion to

modeled units of grams dry weight was made. Barko et al. (1985) also found that algal populations were dominated by Bacillariophyceae (diatoms), Cyanophyta (blue-greens), and Pyrrophyta (dinoflagellates); therefore, this grouping was used for the three modeled algal compartments. Because diatoms dominated the reservoir in the spring, the total chlorophyll value for initial conditions was assumed to be diatoms. For purposes of confirmation, the mass of the three algal compartments was summed and converted to chlorophyll-a.

19. Dissolved organic carbon was used to estimate refractory and labile DOM, with 30 percent estimated to be labile. Dissolved organic carbon was assumed to be 46 percent of DOM. Estimates of fish mass were obtained from Leidy and Jenkins (1977). Because the water was well aerated on the day that initial conditions were measured, values for iron sulfide were assumed to be zero. The other variables that were not measured, detritus, zooplankton, and materials in the sediments, were given low initial values or values based on the DeGray Lake study. The ranges of values for initial conditions for the two simulation years are listed in Appendix B.

Driving Variables

20. Initial simulations used meteorological data measured at the National Weather Service station at Minneapolis-St. Paul, Minn., 80 km west of the Eau Galle Reservoir. Daily averages were used for dry bulb and dew point temperatures, cloud cover, barometric pressure, and wind speed. During calibration of the 1981 data set, it was noticed that there was too much mixing during a few critical periods of the year. A comparison of wind speeds between the Minneapolis-St. Paul, Minn., and Eau Claire, Wis., weather stations showed a fairly consistent difference between the stations, with the Eau Claire values being lower. The Eau Claire station is approximately 68 km east of the reservoir. For example, for the first week of May 1981, wind speeds averaged 17.8 km/hr at the Minneapolis station, and 13.5 km/hr at Eau Claire, with maximum winds for the period of 31.3 and 23.2 km/hr, respectively. The

calibration simulation was much better with the lower wind values from Eau Claire. The 1982 confirmation simulation showed the same pattern; therefore, wind data from St. Paul were replaced with values measured at Eau Claire. The wind data used for the simulations are shown in Figure 2 (1981) and Figure 3 (1982). The rest of the meteorological data came from the St. Paul station.

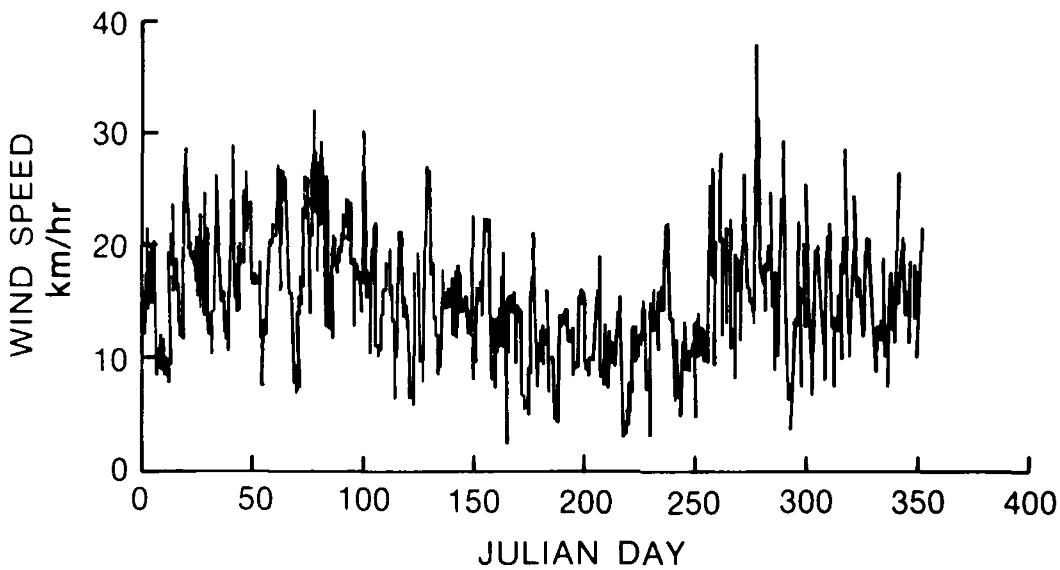

Figure 2. Wind speed used for the 1981 Eau Galle data set

21. Two tributaries were used for simulation purposes. One tributary represented the Eau Galle River and French Creek; the other represented Lousy and Lohn Creeks. For the first simulation, inflow and outflow discharge values were taken from US Geological Survey (USGS) records (1981, 1982), corrected for watershed areas above the gages when compared with areas above the reservoir. These values were not satisfactory, predicting pool levels much lower than measured. In checking the USGS data for the period November 1980 to September 1981, the additional discharge from the reservoir, corrected for areas above the gages, was in error enough to drain the reservoir four times over at the normal pool elevation. Instead of using the USGS data, inflow and outflow discharge values were obtained from damtender records, stored at the US Army Engineer District (USAED), St. Paul. These outflow values

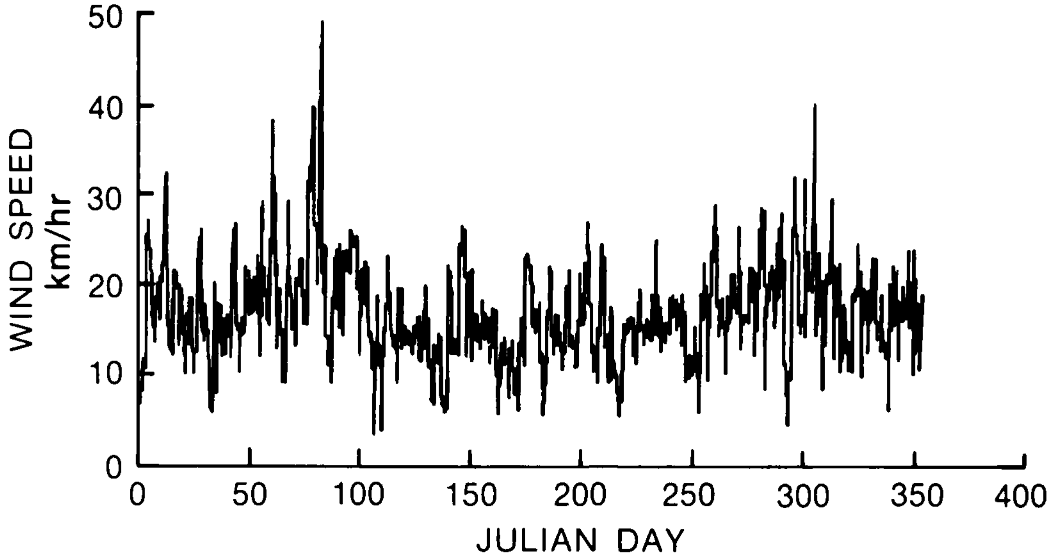

Figure 3. Wind speed used for the 1982 Eau Galle data set

were estimated using a tailwater rating curve, and the inflow values were back-calculated using the outflow values and the change in pool storage. To distribute the inflow between the two modeled tributaries, the ratio from the USGS data was used.

22. Concentrations of constituents in the inflowing water were measured biweekly on all four tributaries. Concentrations for the modeled tributaries were calculated based on the measured value and the amounts of inflow from each tributary. Orthophosphate phosphorus values were found to be related to discharge, so daily concentrations were estimated based on flow using regression techniques. Daily temperature data were available from USGS records measured at Woodville, Wis., approximately 5 km upstream of the reservoir. Using these data, inflow temperatures measured for the four tributaries on a biweekly basis, and regression techniques, daily temperature estimates for the two modeled tributaries were obtained.

Model Coefficients

23. Coefficients included in physical and thermal equations of the model were calibrated using CE-THERM-R1, the thermal portion of CE-QUAL-R1, and temperature data collected in 1981. These coefficients, and others originally estimated from literature values (Collins and Wlosinski 1983, Jørgensen 1979) and other model studies (Wlosinski 1981, Wlosinski and Collins 1985) for biological and chemical processes, were used in CE-QUAL-R1. Again, calibration of the coefficients was performed using reservoir data collected in 1981. The same coefficients were used for the confirmation simulation as were used for the final calibration simulation. Values, units, and an explanation of coefficients are included as Appendix C.

Confirmation Data

24. The majority of confirmation data was of the same form as data for initial conditions. The data usually were collected biweekly at 1-m increments of depth. Variables used for confirmation included temperature, chlorophyll-*a*, silica, total manganese, total organic carbon, dissolved organic carbon, orthophosphate-phosphorus, inorganic carbon, ammonia-nitrogen, nitrite plus nitrate nitrogen, oxygen, pH, alkalinity, total dissolved solids, suspended solids, total iron, sulfate, dissolved manganese and iron, and sulfide. Chlorophyll-*a* was compared to the summation of all three modeled algal compartments. Predicted values for Mn^{+2} and Mn (IV) were combined and compared to total manganese. Total organic carbon included all three algal compartments plus labile and refractory DOM, detritus, and zooplankton. Dissolved organic carbon was compared to the labile plus refractory compartments. Total iron included Fe (III), Fe^{+2}, and 63 percent of iron sulfide. Even though the confirmation simulation used data collected in 1982, similar comparisons were made in 1981 for model calibration.

25. In addition to the concentrations of the above variables, flux rates were available for certain processes. These included algal production,* algal settling,** and sediment oxygen demand obtained from a laboratory study (Gunnison, Chen, and Brannon 1983).

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* Personal Communication, November 1983, J. W. Barko, Research Biologist, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.

** Personal Communication, November 1983, W. F. James, Physical Scientist, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.

PART III: METHODS

Rationale

26. Methods for model confirmation follow from the objective of developing the CE-QUAL-R1 model: to provide CE District and Division Offices with a means of studying preimpoundment and postimpoundment water quality problems and the effects of reservoir operation on water quality. The goal of the confirmation process was to supply the best possible tool, within the assumptions specified for CE-QUAL-R1, for reservoir water quality management. Two main processes were used during the EWQOS Program to evaluate the model (Wlosinski 1984): the first tests the software code; the second examines model predictions. Most of the testing of the software code was performed in earlier studies, and the results have been reported by Wlosinski and Collins (1985). The main purpose of the Eau Galle simulations, reported here, was to examine model predictions.

Variability

27. One of the main assumptions of CE-QUAL-R1 is that the reservoir is spatially one dimensional. The model represents a reservoir by a vertical series of layers, each of which is horizontally uniform. Several factors contribute to variability between model and prototype. Near tributaries, inflowing water affects measured concentrations, and the one-dimensional assumption is weakened. Macrophyte beds in shallow areas affect that part of the system more than deeper, macrophyte-free areas. In addition, the equations of the model cannot be solved in closed form; time steps are needed to find approximate solutions to the equations. Within each modeled time step (often 1 day for CE-QUAL-R1), details may be lost. The model will predict one value for each variable in each layer during a time step. In the real system, the actual range of values can be great. Consider, for example, Figure 4, which is a graph of oxygen values measured at three different stations during a

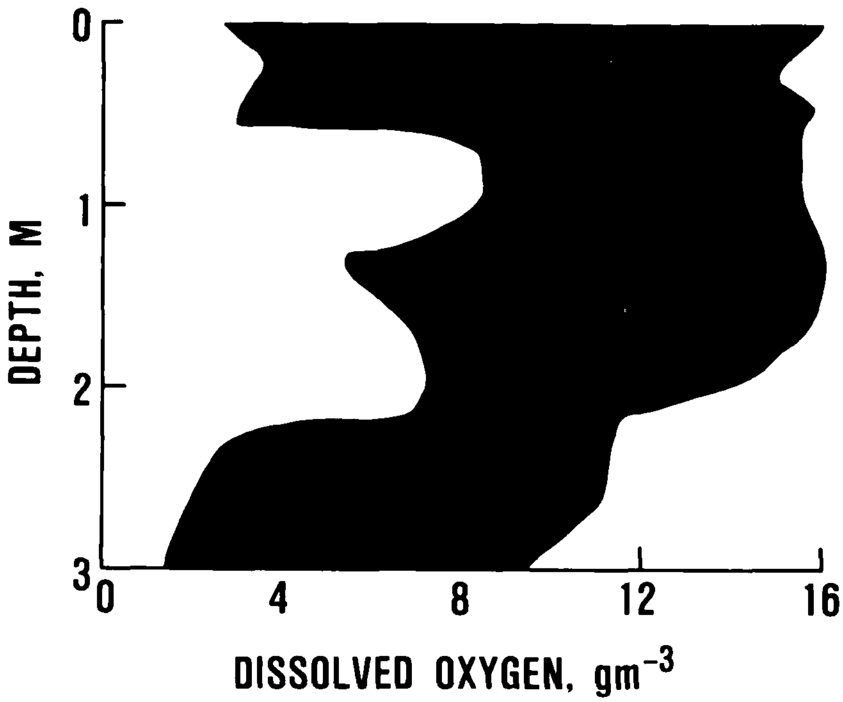


Figure 4. Example of oxygen variability (shaded area) at different locations during a 24-hr period at Eau Galle Reservoir. Data were collected on 2 September 1981

24 hr period on 2 September 1981. The values range between 17 and 182 percent of saturation at the temperatures measured. With such high variability, model evaluation would be very difficult, considering the one-dimensional assumption. Rather than accounting for data variability between stations, the single predicted value for each variable at each layer was compared to the value measured only at station 20. Station 20 was chosen because it was the deepest station and had the most data. The evaluation process would then show whether or not the model is predicting the major changes occurring in the reservoir.

Evaluation Process

28. Both graphical and statistical tests were made for predicted versus measured data. Qualitatively, graphs were prepared showing

vertical profiles of measured versus predicted data for approximately 20 variables. The number of comparisons for each variable on each sampling day was usually between 7 and 10, with between 12 and 32 sampling dates for each variable for each year. In 1981, a total of 3,408 comparisons were made; in 1982, the number was 3,251.

29. Because of the large amounts of measured data that were available for model confirmation, adequate judgment of the total model was difficult by only viewing graphs. A change in a particular algorithm or a different set of coefficients may have improved some variables, or improved some profiles of a particular variable, while making others less desirable. For those cases, statistical analysis for all comparisons was helpful. These analyses were used to test which of two algorithms for a particular process was a better predictor or which of a number of sets of coefficients produced simulation curves that most closely corresponded to all observed data.

30. The statistic used for comparison was the Reliability Index (RI) of Leggett and Williams (1981). It is a good statistic for aggregating and comparing results of different variables because it does not depend on whether the observed or predicted value is greater; also, it is scale variant against additive variation.

31. The statistic was computed for each variable on each sampling day, as well as for each variable over depth and time. An average value for all composite RIs was calculated to give the "goodness" for the entire model. Calculated values of RI could range from 1.0, for the case of perfect prediction, to infinity. If all comparisons had measured versus predicted values within a factor of two of each other, the value for the RI would be 2.0. An RI of 10.0 signifies that the differences between measured and predicted values were an average of one order of magnitude apart, while an RI of 100.0 signifies that the comparisons were two orders of magnitude apart.

32. Besides comparing the concentration of predicted versus measured variables, predicted flux values were compared to their measured counterpart. Data were available on algal settling, gross production, and oxygen utilization at the sediment-water interface. Settling and

gross production values were measured in situ. Oxygen utilization values were measured in laboratory studies (Gunnison, Chen, and Brannon 1983). Predicted flux values were not checked for each calibration simulation because the flux utility is used after a CE-QUAL-R1 simulation is finished (Wlosinski 1984).

PART IV: RESULTS AND DISCUSSION

Calibration Simulations

33. Calibration of CE-QUAL-R1, using the 1981 Eau Galle data set, required a number of phases that illustrated the difficulty of producing a model that is always general enough to simulate all reservoirs while only changing model coefficients. Several site-specific modifications had to be made to the model to describe adequately some of the characteristics peculiar to Eau Galle. These changes are discussed in the following paragraphs.

34. Volume of the Eau Galle Reservoir was calculated from sediment range studies performed by the USAED, St. Paul, in 1977. The relationship between measured volume and elevation is presented in Figure 5 (curve A). Model predicted volumes were originally computed from the area-elevation equation,

$$\text{Area} = 5{,}791.\text{EL}^{1.954} \tag{1}$$

where

EL = elevation from the pool bottom (m)

Area = area of the pool at a particular elevation (m^2)

The coefficients of Equation 1 were determined from the sediment studies using regression techniques. Volume, predicted as a function of elevation, is also presented in Figure 5. Because the predicted volumes were considered unsatisfactory, other relationships were tried, and the area-elevation algorithm was replaced by

$$\text{Area} = 4{,}906.\text{EL}^2 - 5{,}707.\text{EL} + 48{,}453 \tag{2}$$

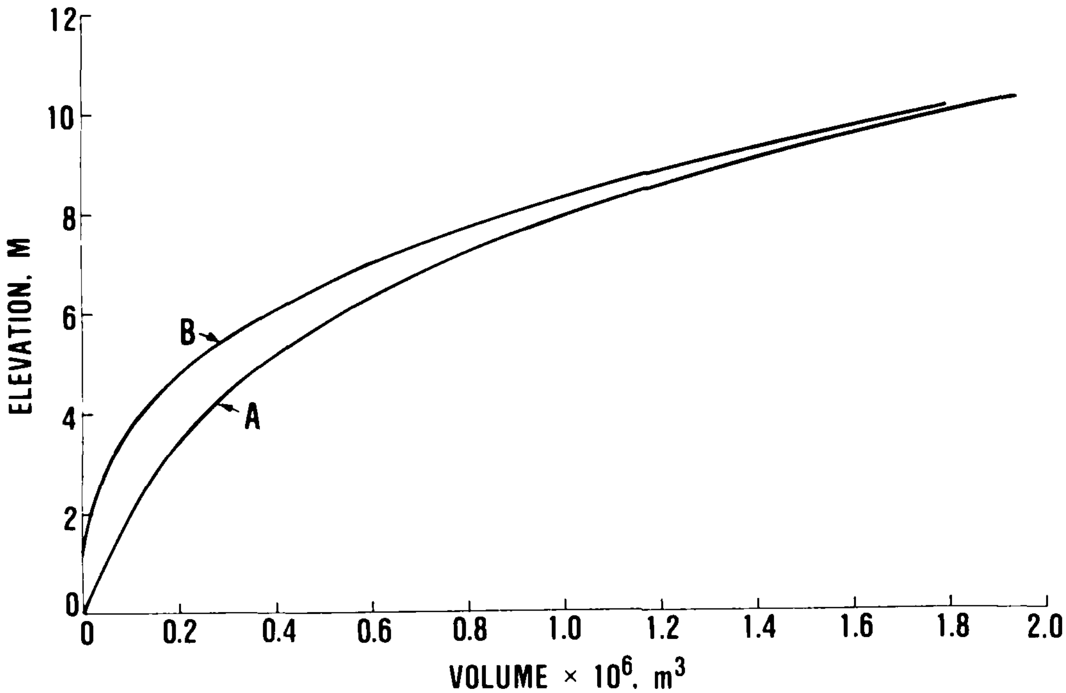


Figure 5. Measured (A) and predicted (B) relationships between elevation and volume in Eau Galle Reservoir

35. Predicted volumes using this relationship were nearly indistinguishable from Figure 5 (curve A). The original volume relationship (corresponding to Equation 1)

$$\mathrm{Vol} = \frac{5{,}791.\mathrm{EL}^{1.954 + 1}}{1.954 + 1} \tag{3}$$

was replaced with

$$\mathrm{Vol} = \frac{4{,}906.\mathrm{EL}^{3}}{3} - \frac{5{,}707.\mathrm{EL}^{2}}{2} + 49.453.\mathrm{EL} \tag{4}$$

36. These changes were made only for the Eau Galle simulation study. The original area-elevation algorithm used in the model is considered satisfactory for representing drowned river valleys. In the case of the Eau Galle Reservoir, a borrow area in the conservation pool (US Army Engineer District, St. Paul 1964) was large enough to disturb

the original dimensions describing the valley. Figure 6 represents contours for the conservation pool which were obtained from the 1977 sediment range studies. The area below 279 m represents, approximately, the borrow area. This change produced satisfactory temperature predictions, having an average RI of 1.12.

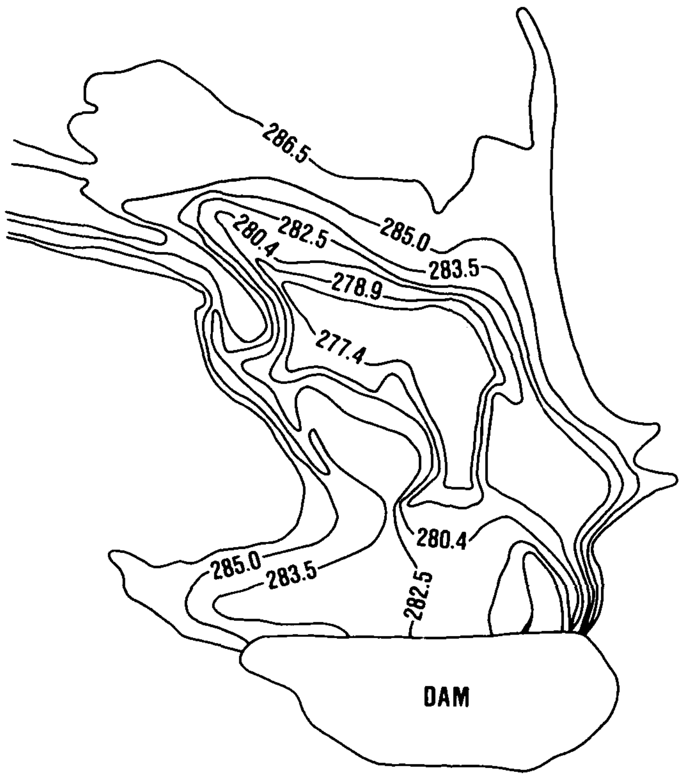


Figure 6. Depth contours for Eau Galle Reservoir

37. After this change was made, the CE-THERM-R1 data set was then used as a basis for the CE-QUAL-R1 data set. The first set of predictions, using coefficients from the literature and other modeling studies, was considered unsatisfactory. The average RI for this simulation was 6.5, compared to 2.84 and 2.59 obtained for the final DeGray Lake simulations for 1979 and 1980, respectively (Wlosinski and Collins 1985). Subsequently, a number of simulations were made during which biological and chemical coefficients were changed. Although predictions improved, they were still considered unsatisfactory, having an average

RI of 5.03. Evidence from these simulations pointed toward problems with inflow, outflow, and mixing in the lower layers of the reservoir.

38. At that time, conversations with personnel of the USAED, St. Paul, led to the discovery that the old river and creek channels may have been diverted from the borrow area. Station 20, where the vertical profiles for calibration and confirmation data were measured, was in the deepest part of the reservoir, which was located in the middle of the borrow area. Unlike many reservoirs this deep area was not next to the dam (Figure 6), in the old river channel. In a typical reservoir, cooler water entering as inflow follows the old thalweg and can replace the water in the deepest part of the reservoir. This cooler water may also be lost as outflow if the dam is equipped for low-level withdrawal. Because the model representation befits this typical reservoir, changes in pool geometry that alter the normal flow pattern would necessitate model changes representing flow.

39. Evidence did exist to show that construction activities altered these normal flow patterns. On the conservation pool borrow area plan, dated 20 May 1965 (USAED, St. Paul, drawing number M31a.1-L-10/6), a note was made that the Eau Galle River and Lohn and Lousy Creeks may be diverted outside the borrow area limits. This is shown in Figure 7, a picture taken on 23 May 1968, 3 months before the dam was completed. Point A marks the borrow area; B, the inlet of the Eau Galle River; and C, the channelized outlet of Lohn and Lousy Creeks. As can be seen, the river and creeks do not enter the borrow area. Also, a mixing study performed during the summer of 1981 supported this hypothesis. During that study, water from the Eau Galle River entered the reservoir as an underflow at station 40 and continued as an underflow to station 30 (Figure 1). It then spread across the lake as an interflow at a depth from 3-4 m.* It was therefore concluded that the lower elevations of the borrow area were isolated from inflow and outflow effects. To better represent this isolation, it was assumed that the lowest 5 m of the pool was cut off to inflowing and outflowing

* Personal Communication, February 1983, Marc Johnson, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Figure 7. Eau Galle Reservoir, 3 months before dam completion (A is located in the borrow pit, B is located at the inflow of the Eau Galle River, and C is located at the inflow of Lohn and Lousy Creeks)

waters. This step aided model predictions, but problem areas still remained.

40. It appeared at this time that some of the variable concentrations in the metalimnion, during the summer months, were reflecting too much input from inflowing waters, whereas the predictions in the epilimnion would be better if some of the inflowing water was mixed with surface waters. In the original model, inflow placement was dependent only on the density of inflowing water compared to the density within the pool. There is no mixing or entrainment with other layers in the reservoir unless density is nearly the same. As can be seen in Figure 1, reservoir tributaries, especially Lohn and Lousy Creeks, are relatively small, and since flows are usually less than 1 m^3/sec, some mixing is quite reasonable. To test this hypothesis, an algorithm that mixed

inflowing water with the surface layer as a function of wind was added to the model. The algorithm is depicted in Figure 8. The fraction of inflowing water that mixes with the surface increases with an increase in wind or a decrease in inflow discharge. This model change was temporary, being made only for the Eau Galle simulations. Although improvements were made concerning predictions, results were still unsatisfactory. Problems at this time, though, did not appear to be due to mixing or flow problems, but to problems with the biological portion of the model.

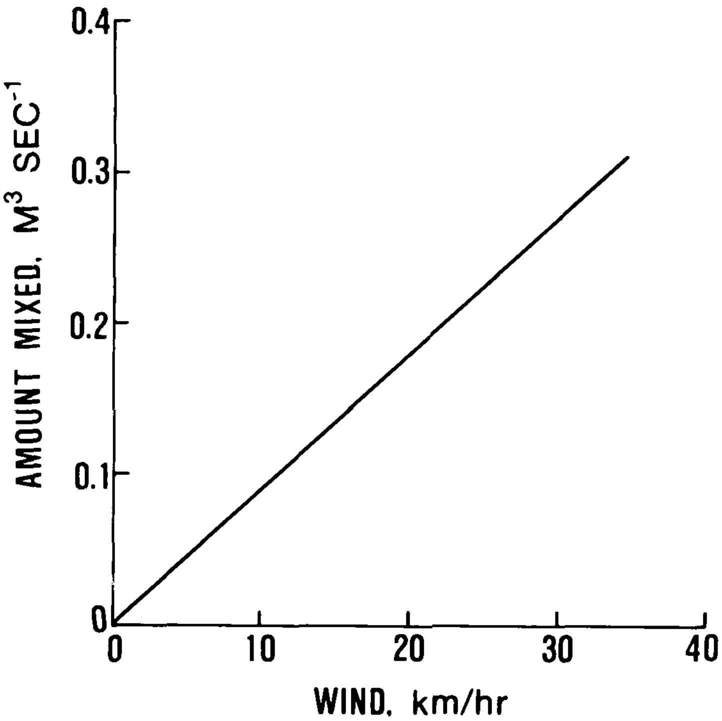


Figure 8. The relationship between the amount of wind and the amount of inflowing water mixing in the surface layer

41. Orthophosphate phosphorus was measured on 7 April 1981, with values ranging in the water column from 0.008 to 0.011 mg/ℓ. It was not possible to predict the diatom bloom of 169 μg/ℓ chlorophyll-a measured on 21 April when using the measured orthophosphate values. Even if all of the orthophosphate measured was converted to algae, with no algal

losses to sinking, respiration, zooplankton ingestion, or other factors, the level of algae would not be as high as measured on 21 April. During this 2-week period, flow levels remained low, as did measured concentrations of orthophosphate in the inflow. On 4 April, 3 days before the start of simulation, 1.46 in. of rainfall caused the flow of the Eau Galle River to rise from a normal 0.2-0.9 m^3/sec to 6.7 m^3/sec. This rise, along with a probable increase in orthophosphate concentrations (Ashby and James 1985), may have supplied the phosphorus needed for growth. The diatoms may have increased their internal phosphorus concentrations by way of luxury uptake (Rhee 1974, Collins 1980). Luxury uptake is not modeled in CE-QUAL-R1, and to do so would make the model more complex than is needed for the Corps. To overcome this problem, the initial conditions for orthophosphate were increased to a value between measured orthophosphate and total phosphorus. For the 1982 confirmation simulations, the measured values (near 0.08 mg/ℓ) for orthophosphate were used.

42. To help locate other problem areas, equivalent changes were made to the flux model, with flux predictions then being checked. Predictions for which data were available (algal s :ting, gross production, and oxygen utilization at the sediment-water interface) appeared reasonable. Although most of the biological variables are interconnected, with changes to one variable affecting the predicted results of other variables, it appeared from studying the results that most of the problems were due to an excess of nitrogen in the system when anaerobic conditions existed, and to the zooplankton compartment not responding properly to changes in food concentrations. Denitrification can occur intensely in anaerobic environments, a process by which nitrite is reduced to elemental nitrogen, which can then be lost from the system. This process was permanently added to the model after simulations showed improved predictions.

43. To improve the zooplankton-algae relationship, a threshold value at which grazing commences was added to the zooplankton ingestion algorithm. Experimental evidence on a grazing threshold was supplied by Parsons, LaBrasseur, and Fulton (1967) and McAllister (1970). However,

in a review of simulation modeling of zooplankton, Leidy and Ploskey (1980) mention that the need for a grazing threshold may stem from inappropriate assumptions or our ignorance of the grazing dynamics of zooplankton. This may very well be true, but in the case of CE-QUAL-R1, zooplankton are modeled mainly because of their impact on other variables that are of greater environmental impact, namely oxygen and algae. Therefore, to restrain additional complexity, only the threshold for grazing was added.

44. Other changes to the model that were made at this time included a minor correction to the adsorption algorithm and simplifications to the anaerobic portion of the model. As with many other chemical and biological rates in the model, many of the anaerobic processes were temperature dependent. Unfortunately, very little information is available in the literature concerning temperature dependence. Because the temperature coefficients used for both the DeGray Lake and Eau Galle Reservoir simulations were such that the temperature range during the year would have no effect on the rates of anaerobic processes, it was recommended that the temperature coefficients be removed. This change reduces the number of coefficients by 78, and thus saves time in data set preparation.

45. After these changes were made and a number of calibration simulations were made to fine-tune the model, comparisons of predicted to measured values were much more acceptable, giving an overall RI of 2.63. A confirmation simulation, using the same coefficients in the 1982 data set as used for 1981, also produced acceptable results, giving an overall RI of 2.71. However, the fluxes for the confirmation were considered unsatisfactory. Predictions of gross production were nearly an order of magnitude lower than measured values, algal settling predictions were nearly an order of magnitude low, and sediment oxygen utilization was nearly an order of magnitude high, consuming over 80 percent of all oxygen used for respiration. In addition, algal respiration was only 8 percent of gross production, an extremely low value. Thus, it appeared that acceptable predictions were being made for the wrong reasons. After another set of calibration simulations were made, while

adjusting coefficients dealing with the above rates and checking flux predictions, acceptable results were again obtained. The final overall RI for the 1981 data set was 2.57, and for the 1982 confirmation data set, 2.62. A discussion of the flux predictions for the final simulations is provided in the last section of Part IV.

46. Statistical results for each variable from the final calibration simulation are presented in Table 1 (see Wlosinski 1984 for a discussion of statistics). Figure 9 presents four graphs (representing different dates) of each of 19 variables, comparing predictions (solid lines) to measured values (dots). The graph for the date with the poorest RI is included for each variable. Values for the RI ranged from 1.07 to 4.85. In general, variables whose concentration normally ranges over more than one order of magnitude had higher RI values. For example, orthophosphate phosphorus values ranged from 0.001 to over 1.0 mg/ℓ and had an RI of 4.84, whereas total dissolved solids, which ranged from 168 to 225 mg/ℓ, had an RI of 1.24. Predictions of temperature, which are extremely important because of the effect of temperature on most biological processes, were considered excellent, having an RI of 1.09. The timing of initial stratification and of fall overturn was good, as was the shape of the temperature profile.

47. Most of the major dynamics of other variables were predicted correctly. Chlorophyll predictions in the epilimnion were usually within a factor of two. Hypolimnetic predictions were not as good, but were still considered acceptable. Even though the graphics and statistics were performed on the summation of the predicted values for the three algal compartments, individual comparisons in the epilimnion can be made to assess the model's ability to predict seasonal succession of major groups. As stated earlier, Barko et al. (1985) found that algae were dominated by the Bacillariophyceae (diatoms), Cyanophyta (bluegreens), and Pyrrophyta (dinoflagellates). Using data supplied in their paper, graphs representing seasonal succession of the three major compartments were made for the epilimnion (Figure 10). The solid line represents measured data, and the dots represent model predictions. It is apparent that the model reasonably predicted the seasonal succession

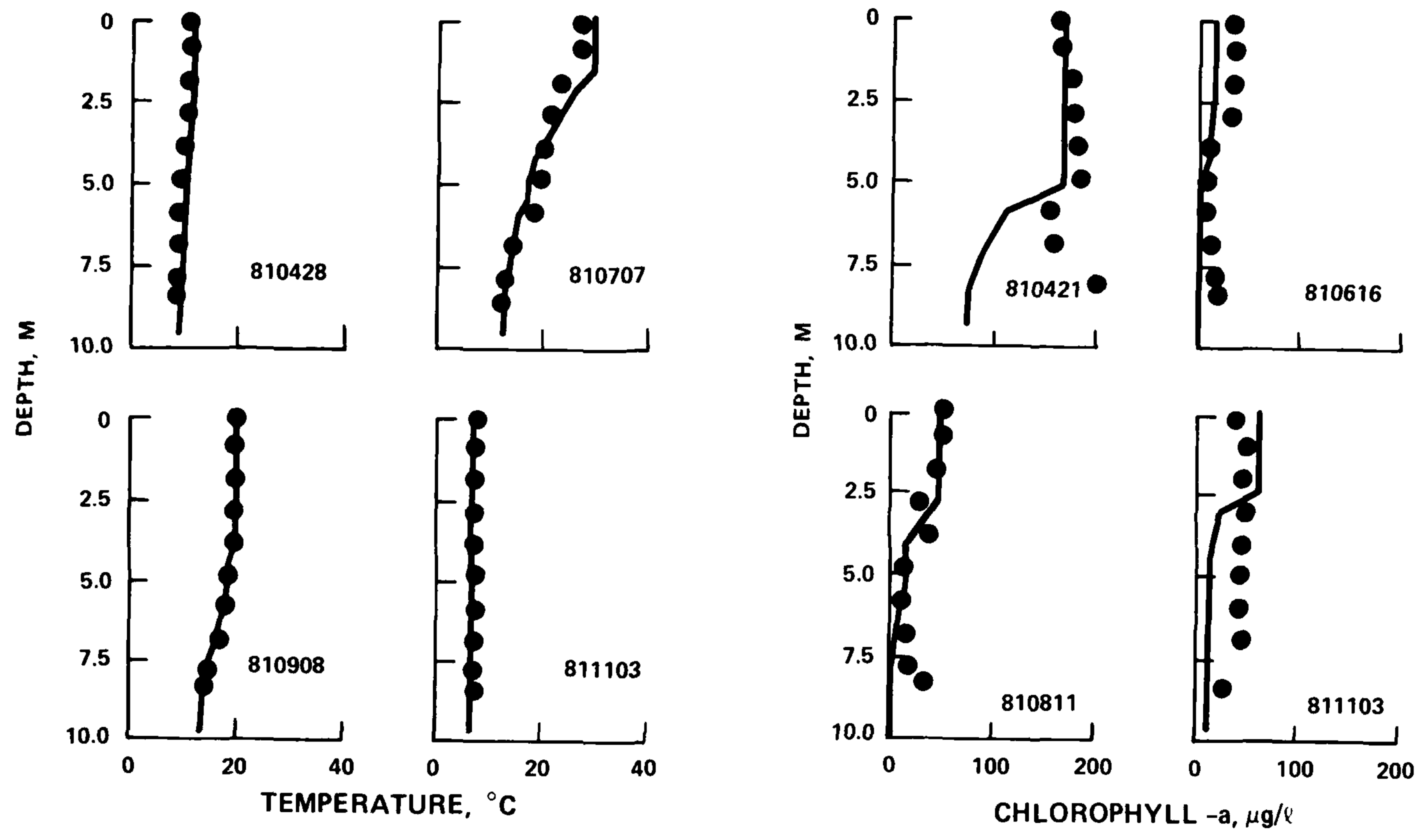


Figure 9. Comparison of predicted values to measured data for 19 variables--final Eau Galle calibration simulation, 1981. The solid line represents model predictions; dots represent measured values (Sheet 1 of 10)

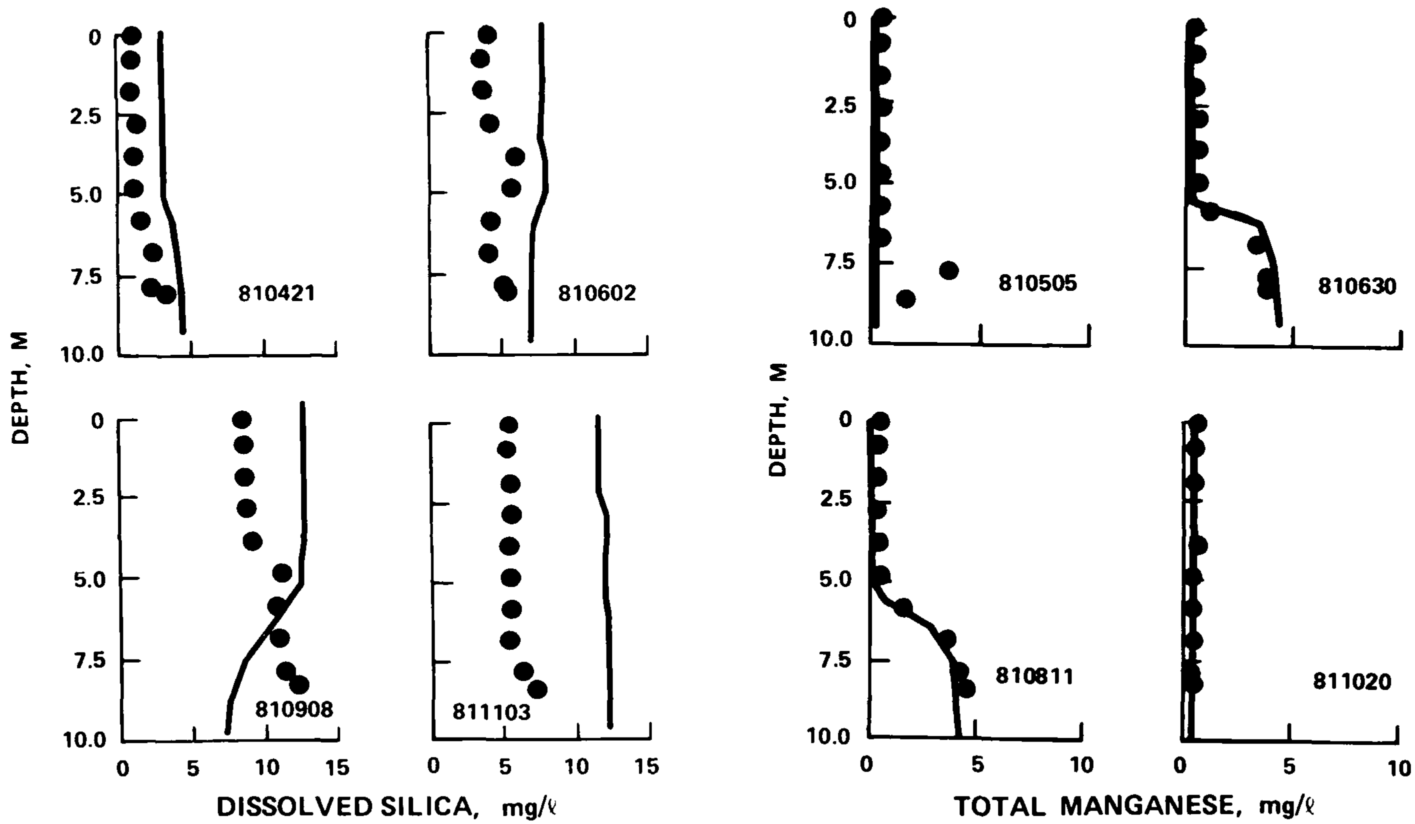
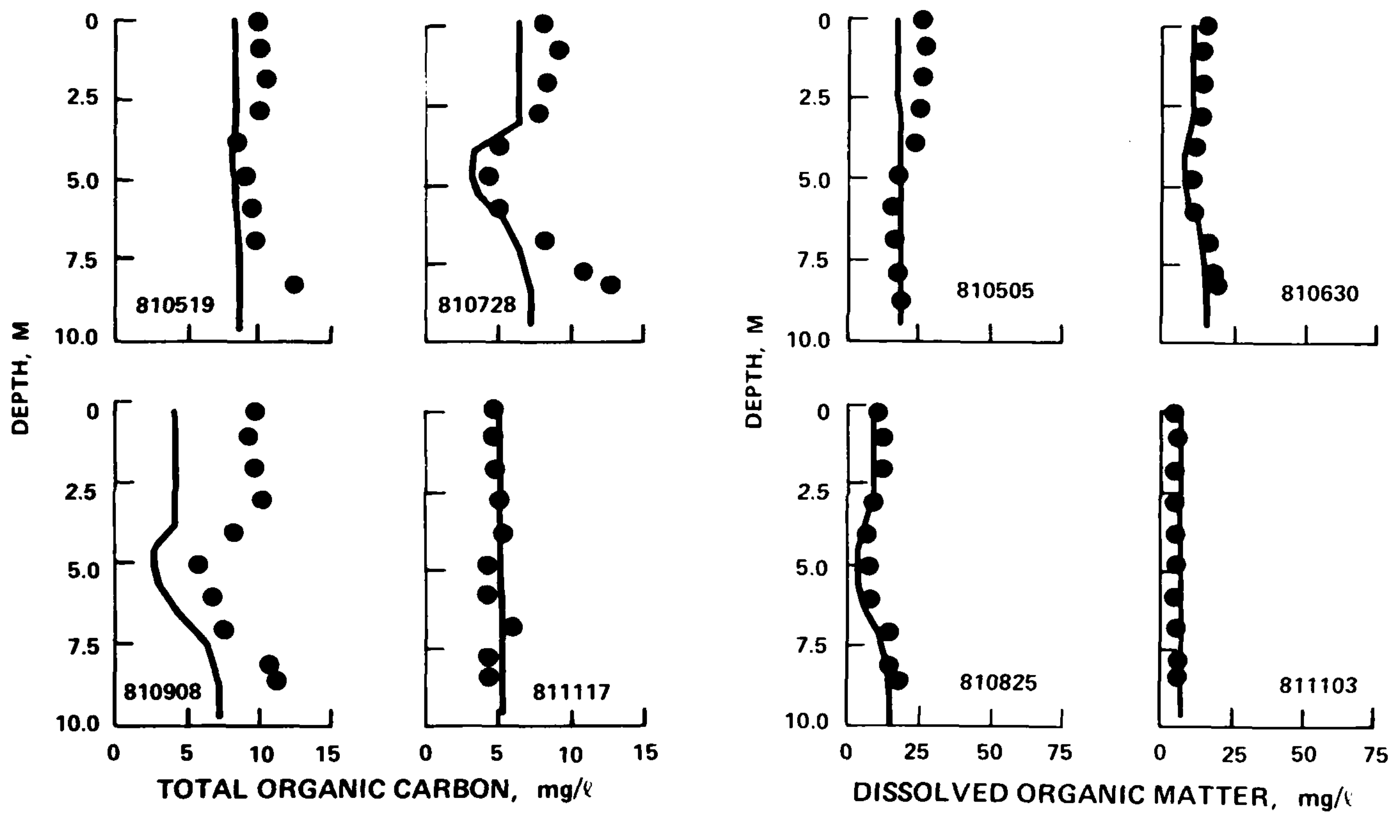


Figure 9. (Sheet 2 of 10)



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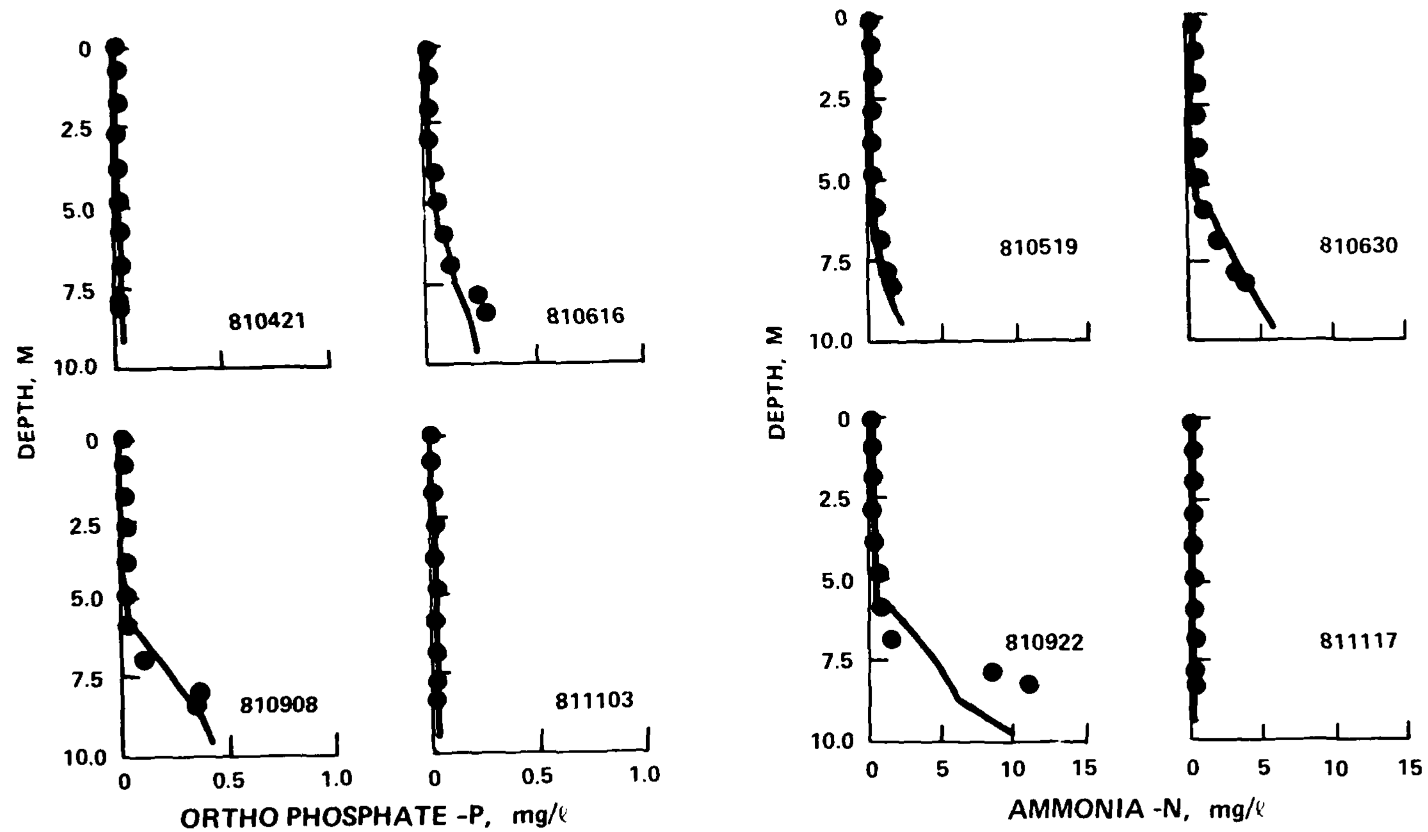

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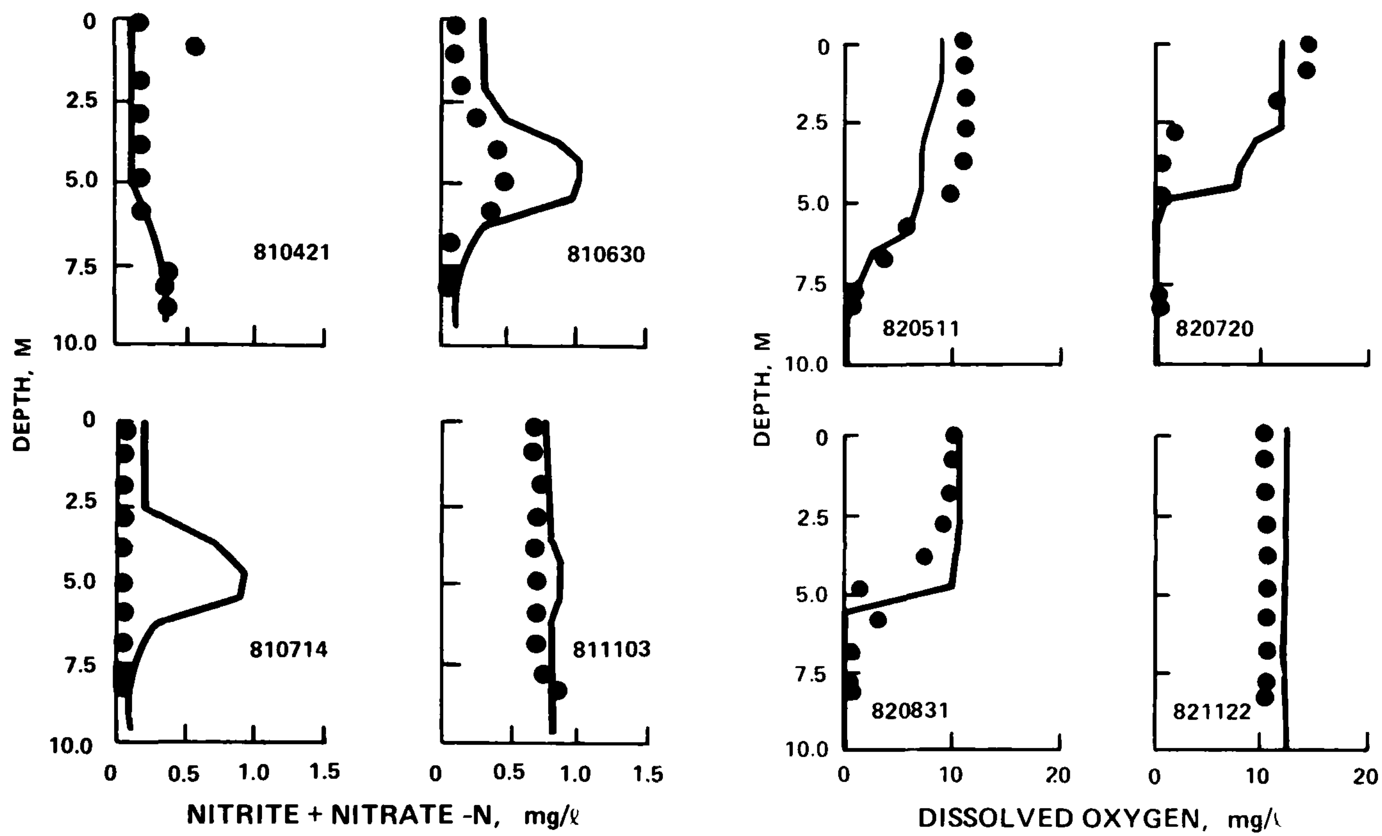

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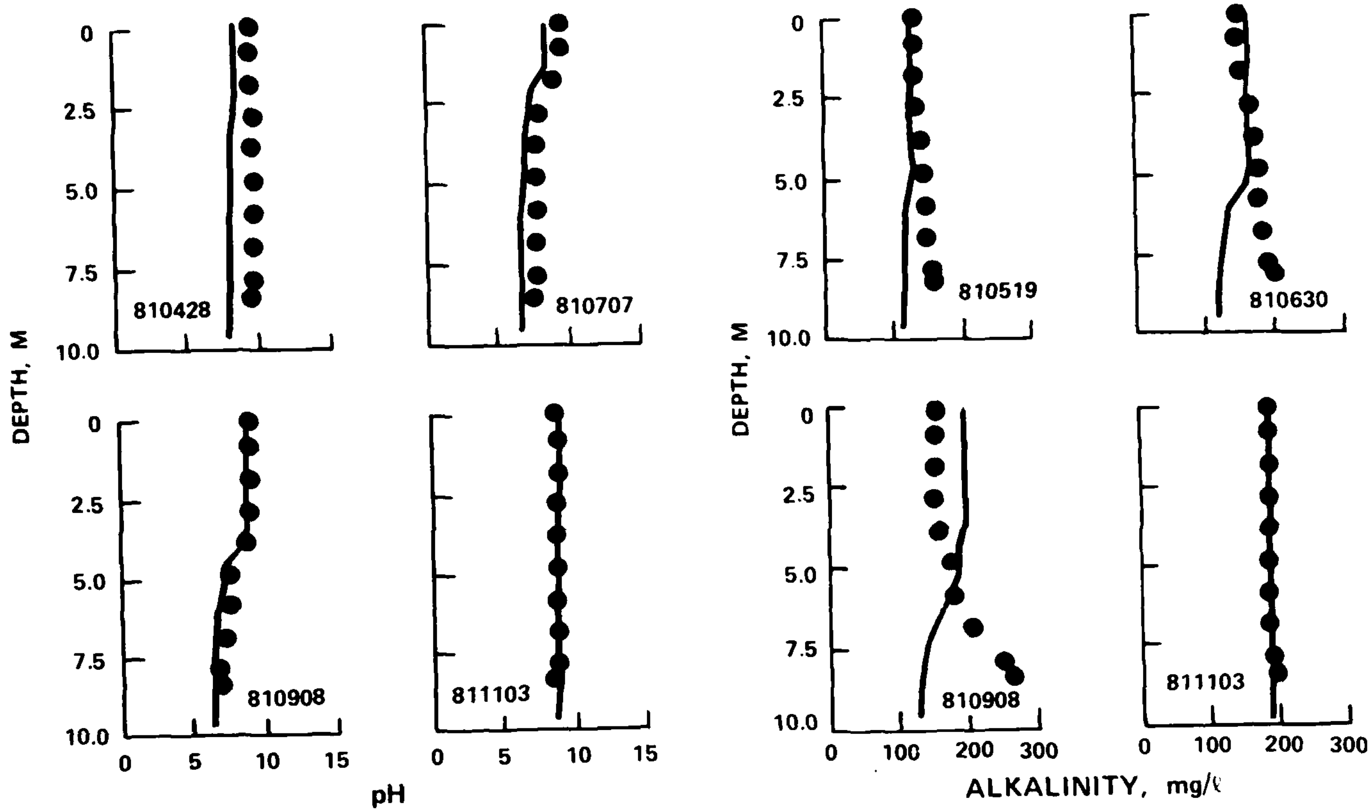

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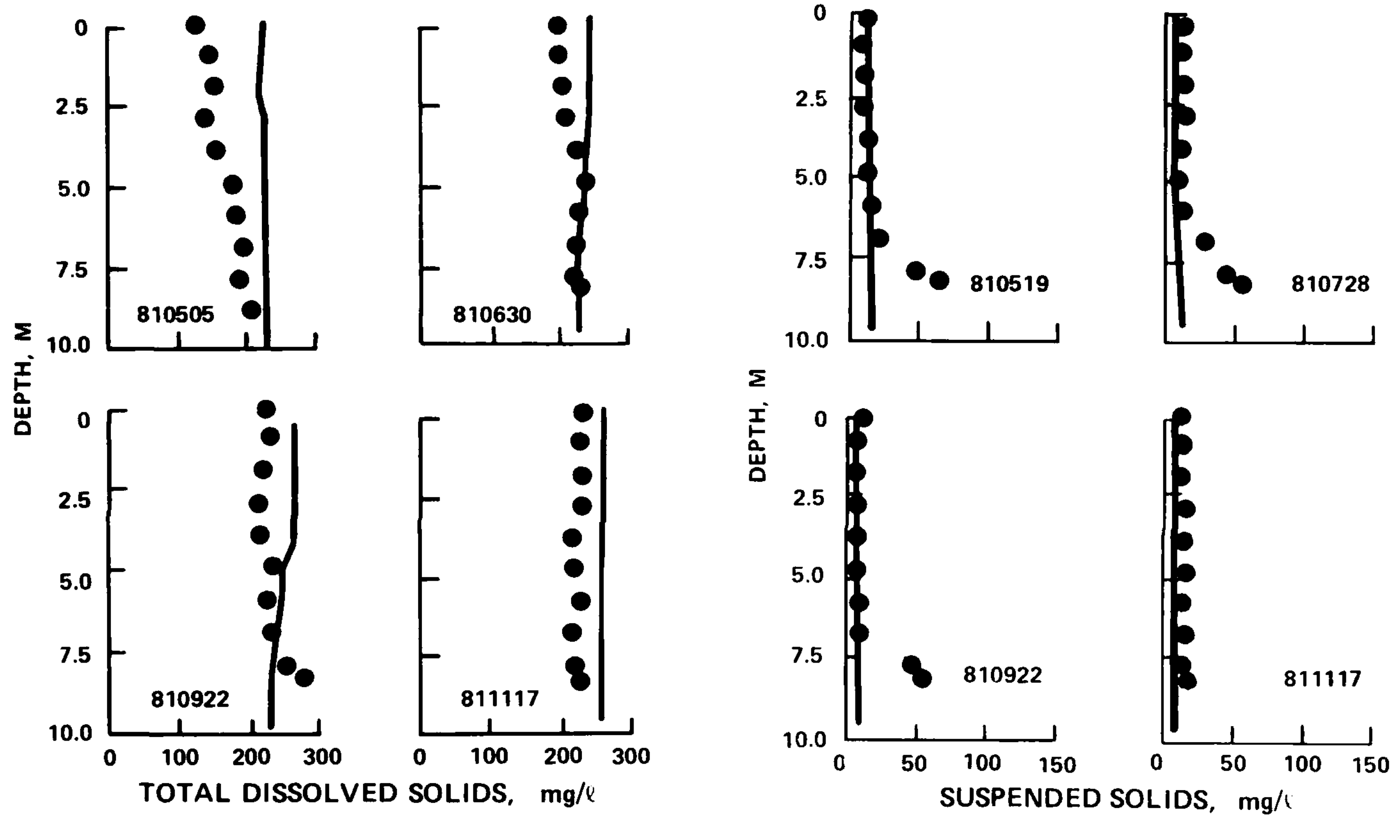

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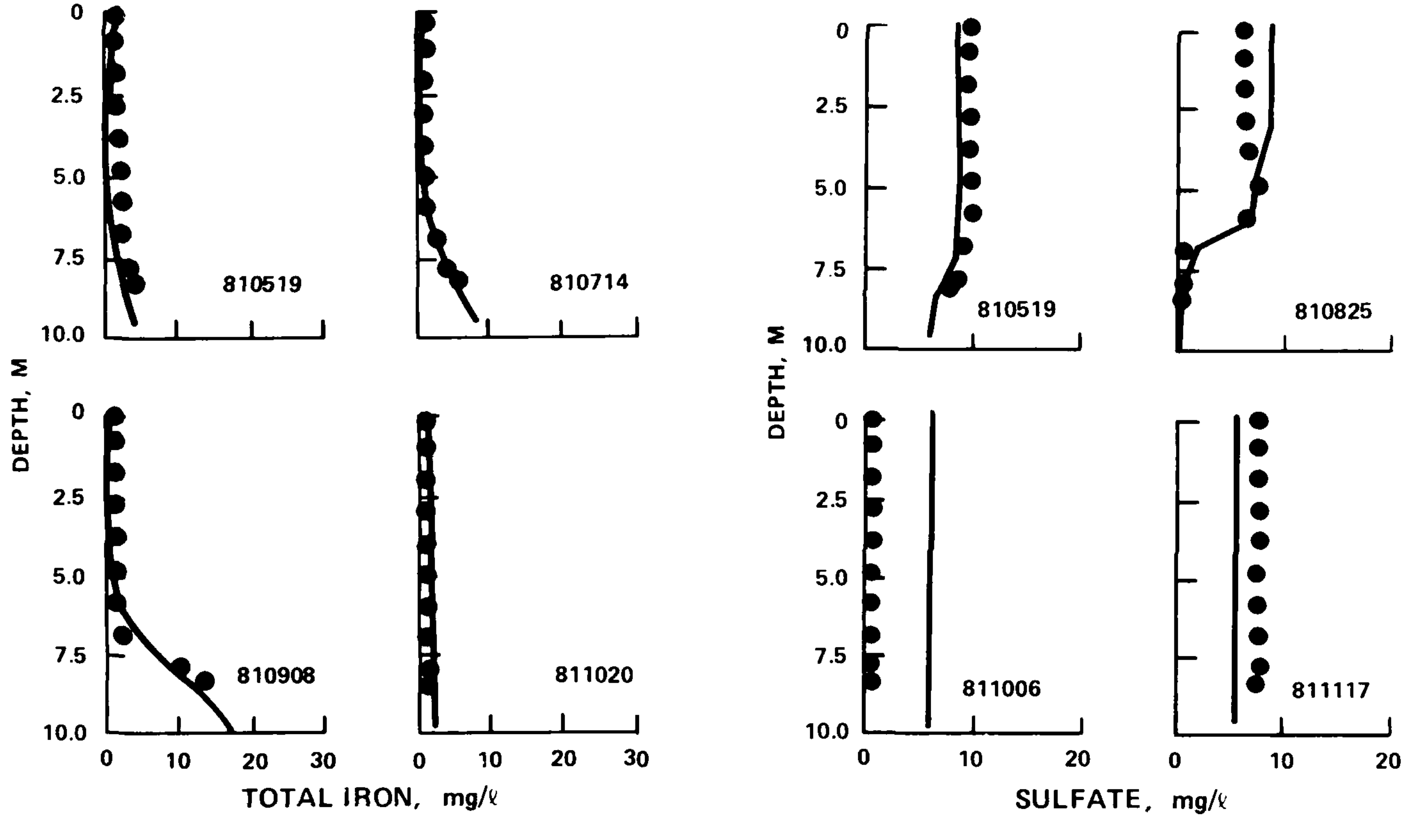

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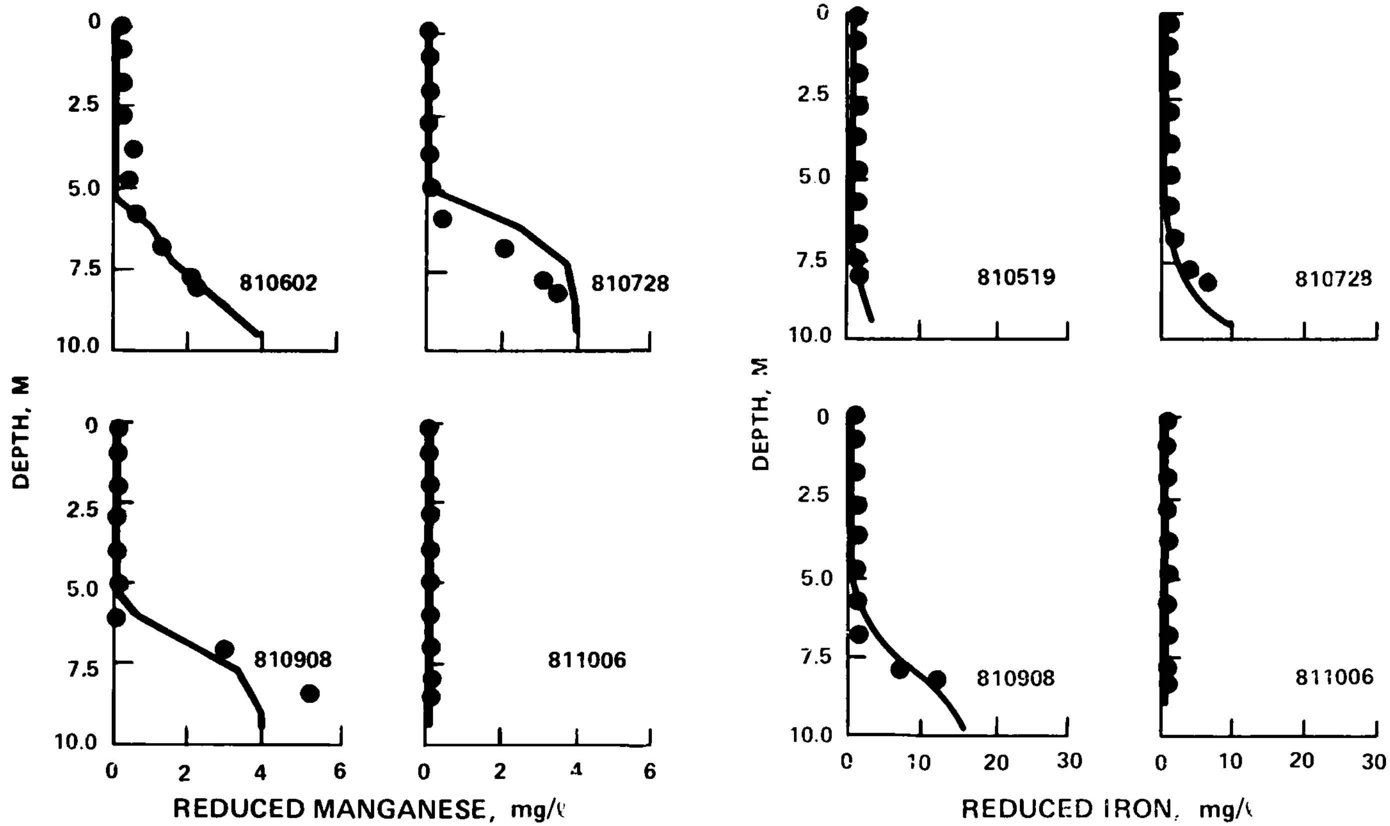

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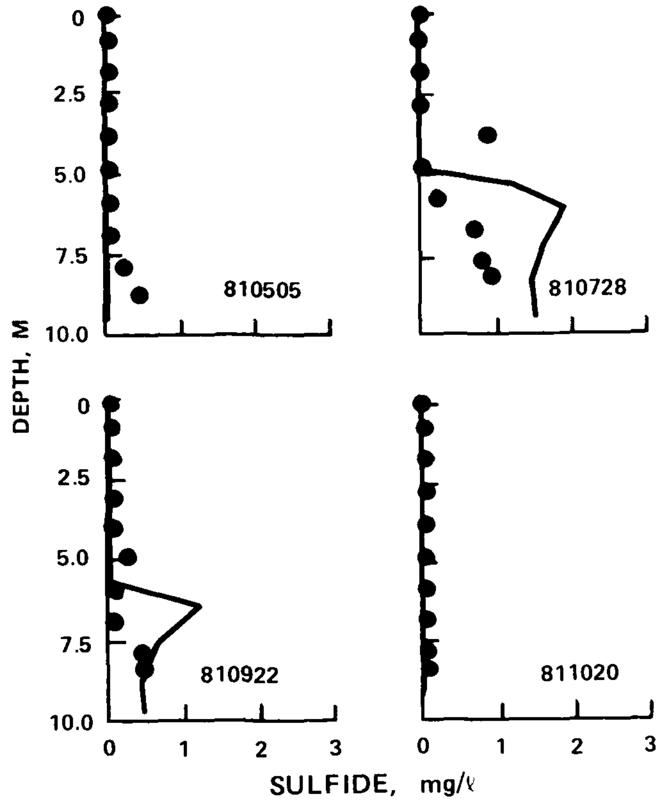

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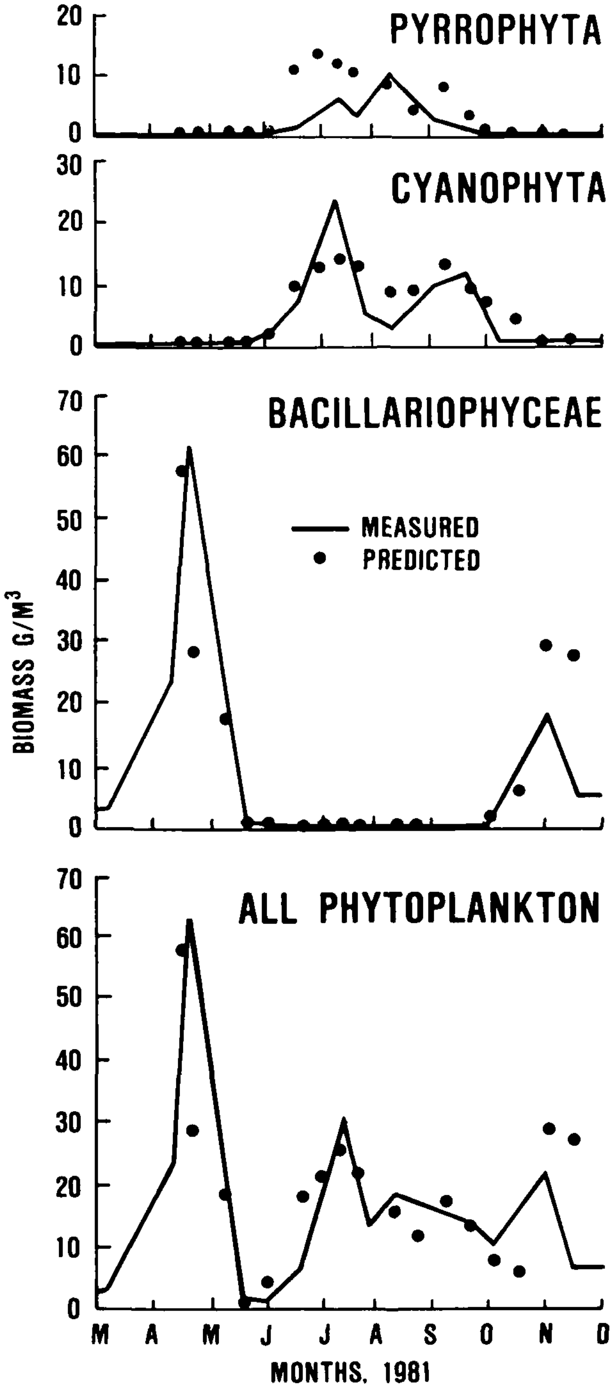

Figure 10. Measured data (solid line) (from Barko et al. 1985) and model prediction (dots) of phytoplankton in the epilimnion at station 20

of the dominant algal groups measured in Eau Galle Reservoir in 1981.

48. Most of the predicted dissolved silica values were above measured values, averaging 9.19 versus 6.05 mg/ℓ, respectively. The problem may be due partly to the model's constant stoichiometric equivalent between algae and silica, which can vary in the field, and partly to silica adsorption and sedimentation in reservoirs, a process not included in the model. Silica adsorption should be considered for future model applications if diatom dynamics are important for a particular study. The major difference of both ammonia-nitrogen and phosphate-phosphorus concentrations was spatial, in that concentration differences of over two orders of magnitude between the surface and bottom waters occurred. Acceptable predictions of these differences were made.

49. The dynamics of nitrite plus nitrate were more difficult to predict, even with the process of denitrification added to the model. Early in the calibration process, problems occurred in predicting the maxima that often occurred at 3-6 m (e.g. Figure 9, sheet 5, date 810630), a problem that was later solved by not allowing inflow into the layers representing the borrow area. However, on 14 July the bulge disappeared, only to recur on 28 July. This disappearance was not predicted by the model. The low values in the epilimnion and hypolimnion during stratified periods were predicted correctly, but for different reasons. In the epilimnion, the loss from the compartment was due to the utilization of the nutrient by way of photosynthesis, whereas the loss in the hypolimnion was due to denitrification. On 14 July, virtually no oxygen was measured at station 20 below 3 m, whereas the model predicted up to 3 mg/ℓ between 3 and 5 m. Since denitrification occurs only under anaerobic conditions, the positive oxygen predictions between 3 and 5 m probably caused the problem with the nitrite-nitrate compartment.

50. Although most of the oxygen predictions were quite close to measured values, the scenario above illustrates the problems that can occur if the predictions are not exact. In this case the problem was due, to a large measure, to the one-dimensional assumption and the mixing of inflowing waters. At 3 m below the surface at station 20, where the confirmation data were measured, the concentration of dissolved

oxygen was 0.5 mg/ℓ and the concentration of nitrite-nitrate was 0.003 mg/ℓ. At station 30 (Figure 1), at the same depth and time, oxygen was measured as 6.8 mg/ℓ and nitrite-nitrate as 0.296 mg/ℓ. Thus, denitrification could have occurred at station 20, but not at 30. This was probably due to the influence of inflowing waters, which affect station 30 more than station 20.* On July 14, oxygen concentrations in the inflowing waters of the Eau Galle River and French Creek were near 6.4 mg/ℓ, and nitrite-nitrate concentrations were near 0.8 mg/ℓ. Temperatures for the two tributaries were 18.0 and 14.5° C, respectively, whereas the temperature at station 30 ranged from 24.7 to 21.7° C. Inflowing water probably entered the reservoir as an underflow and followed the old thalweg to station 30.

51. Because nitrite-nitrate values at station 20 ranged from undetectable limits to 0.03 mg/ℓ, with values below the dam at 0.5 mg/ℓ, it is suggested that under some conditions some of the inflowing water may have followed the thalweg to, and through, the outflow port. For these same reasons, care must be taken when using outflow concentrations predicted by the model if the deepest part of the reservoir is not near the outlet ports. Conditions in the littoral zone may then dominate the outflow.

52. Two other variables exhibited concentration differences between the midlayers and the epilimnion and hypolimnion, this time in the form of minima. Both total organic carbon and dissolved organic carbon had lower concentrations between 3 and 6 m than found in the epilimnion or hypolimnion and, again, lower values in the inflow that were placed in the metalimnion could help explain the dynamics. The model predicted these minima.

53. There was one other event that was not predicted at all by the model. Sulfate, the concentrations of which were normal through August for a system with a clinograde oxygen curve, fell to near zero for four sampling periods in September and October. Unlike the problem

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* Personal Communication, November 1983, J. H. Carroll, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.

with nitrite plus nitrate, these low values were found at all pool stations, including station 40, as well as the downstream station. Even though some of the inflowing concentrations for this period were low, others were as high as 14.5 mg/ℓ. Although field personnel noticed the low concentrations and authenticated the results,* they were unable to establish a cause for the phenomenon. Sulfate dynamics during other months, as well as the dynamics of other anaerobic variables, were predicted satisfactorily.

54. Macrophyte biomass measurements were taken in 1981 (Filbin and Barko 1985). Because their measurements were taken on an aerial basis, the RI statistic was not used for comparing measured and predicted values. Filbin and Barko reported that the macrophyte biomass and associated epiphytes occupied about 17 percent of the surface area of Eau Galle. This figure was used to convert the predicted mass from units of grams per reservoir to the measured units of grams per square metre. A comparison of predicted versus measured values is presented in Figure 11. Considering that the model lumps all macrophyte and epiphyte species together, predictions are considered acceptable.

Confirmation Simulation

55. Statistical results from the final confirmation simulation of 1982 are presented in Table 2. Comparisons of measured versus predicted values for selected dates are presented in Figure 12. As for 1981, the graph representing the date with the poorest RI is included for each variable. The average RI for all variables was a satisfactory 2.62, with a range from 1.06 to 4.85. The RI for temperature was 1.14, although on a few dates the predicted mixed layer was approximately 1 m too deep. This was probably due to the wind difference between the site and Eau Claire (see paragraph 20), since there was an appreciable difference in temperature predictions depending on the station where meteorological data were measured. The model failed to accurately predict an

* Personal Communication, J. H. Carroll, op. cit.

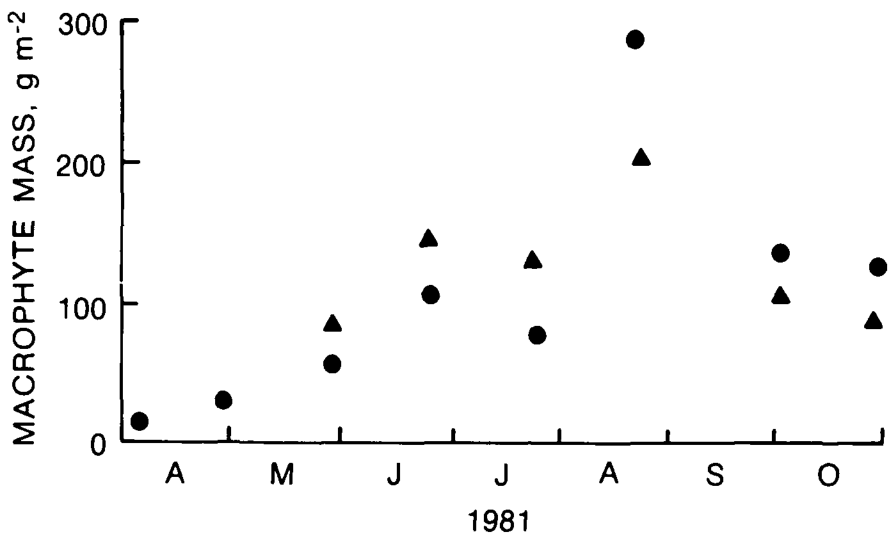


Figure 11. Measured values (circles) and predicted values (triangles) for macrophyte biomass for Eau Galle Reservoir in 1981

algal bloom that was measured on 18 May, which probably also accounted for the high dissolved silica prediction in the epilimnion when the measured values were quite low. Most of the other algal predictions were reasonable, with a predicted average of 19.4 μg/ℓ versus a measured average of 23.5 μg/ℓ. As in 1981, most silica predictions were slightly high and were probably due to the lack of silica dynamics in the model.

56. A slight error in predicting temperature can magnify the errors in predicting other variables. This occurred on 5 October, when the measured temperature profile indicated that fall turnover had not yet occurred, and anaerobic conditions existed 8 m below the surface. Complete mixing was predicted before this date, with the effect that concentrations of ammonia, nitrite plus nitrate nitrogen, suspended solids, total manganese, total iron, sulfate, reduced manganese, and reduced iron were poorly predicted for that date. The dynamics of these variables were predicted correctly; it was the timing that was incorrect. In actual applications of the model, it is much more important to predict the dynamics of the system rather than the timing. This is because the timing is due, to a great extent, to meteorological

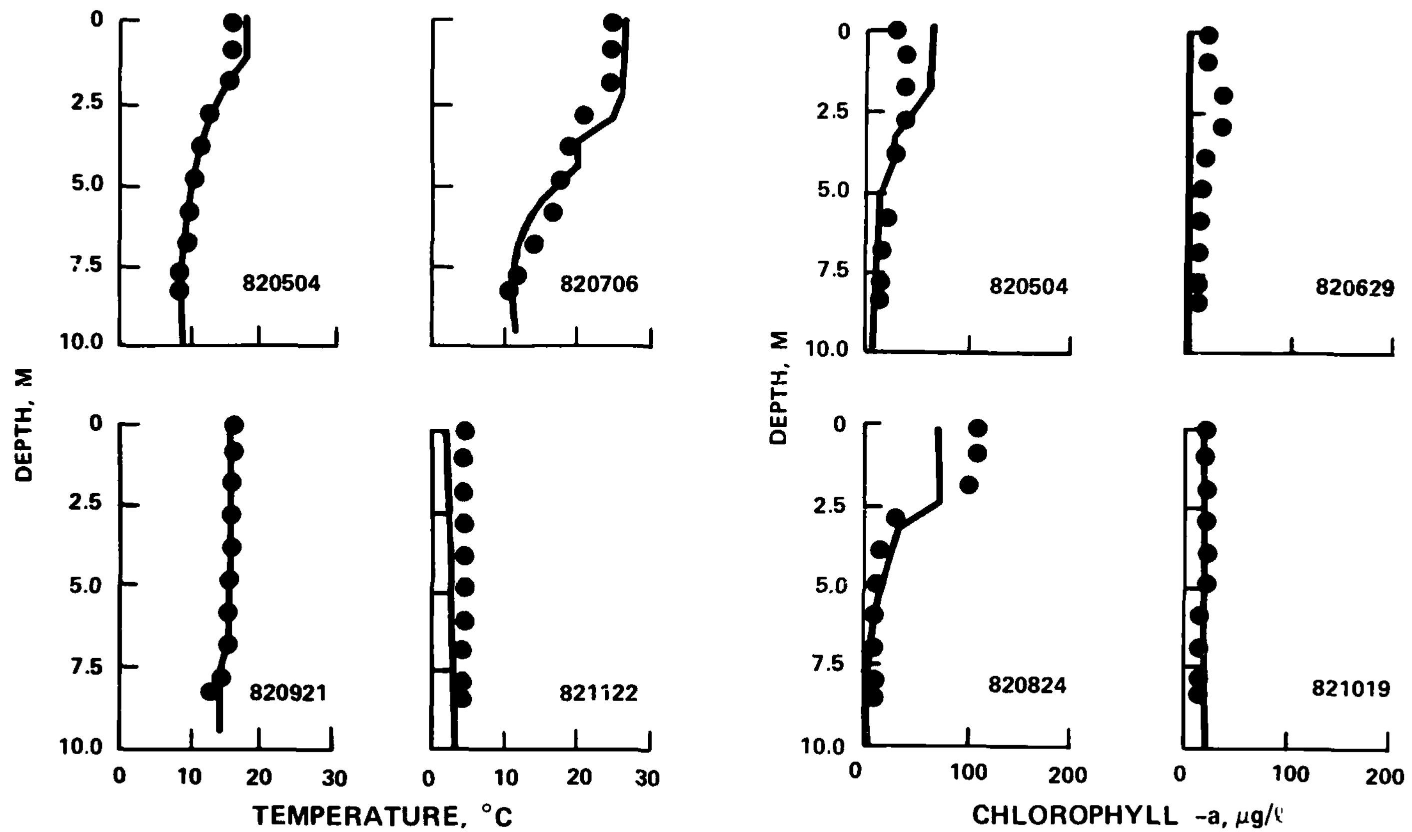


Figure 12. Comparison of predicted values to measured data for 20 variables--final Eau Galle calibration simulation, 1982. The solid line represents model predictions; dots represent measured values (Sheet 1 of 10)

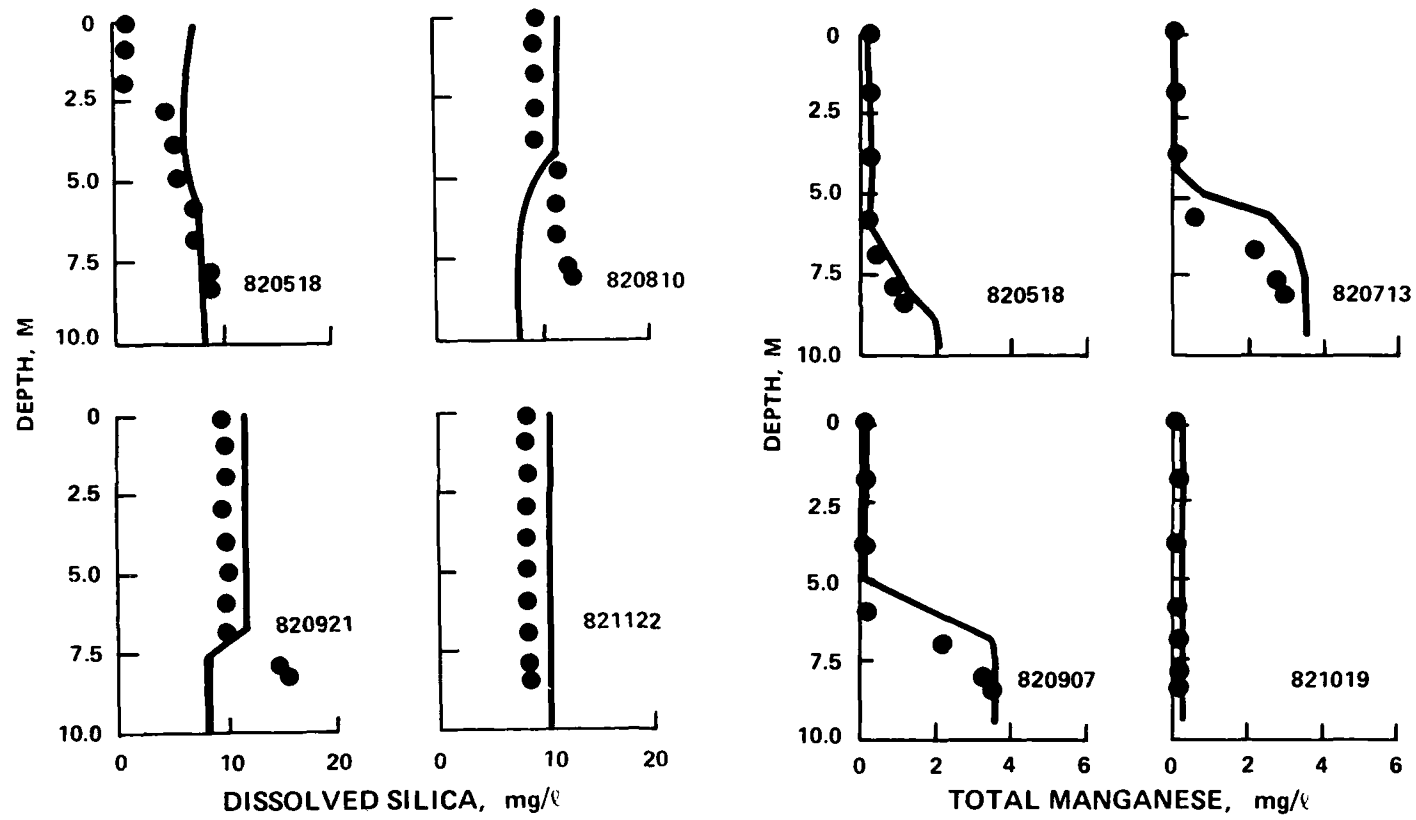
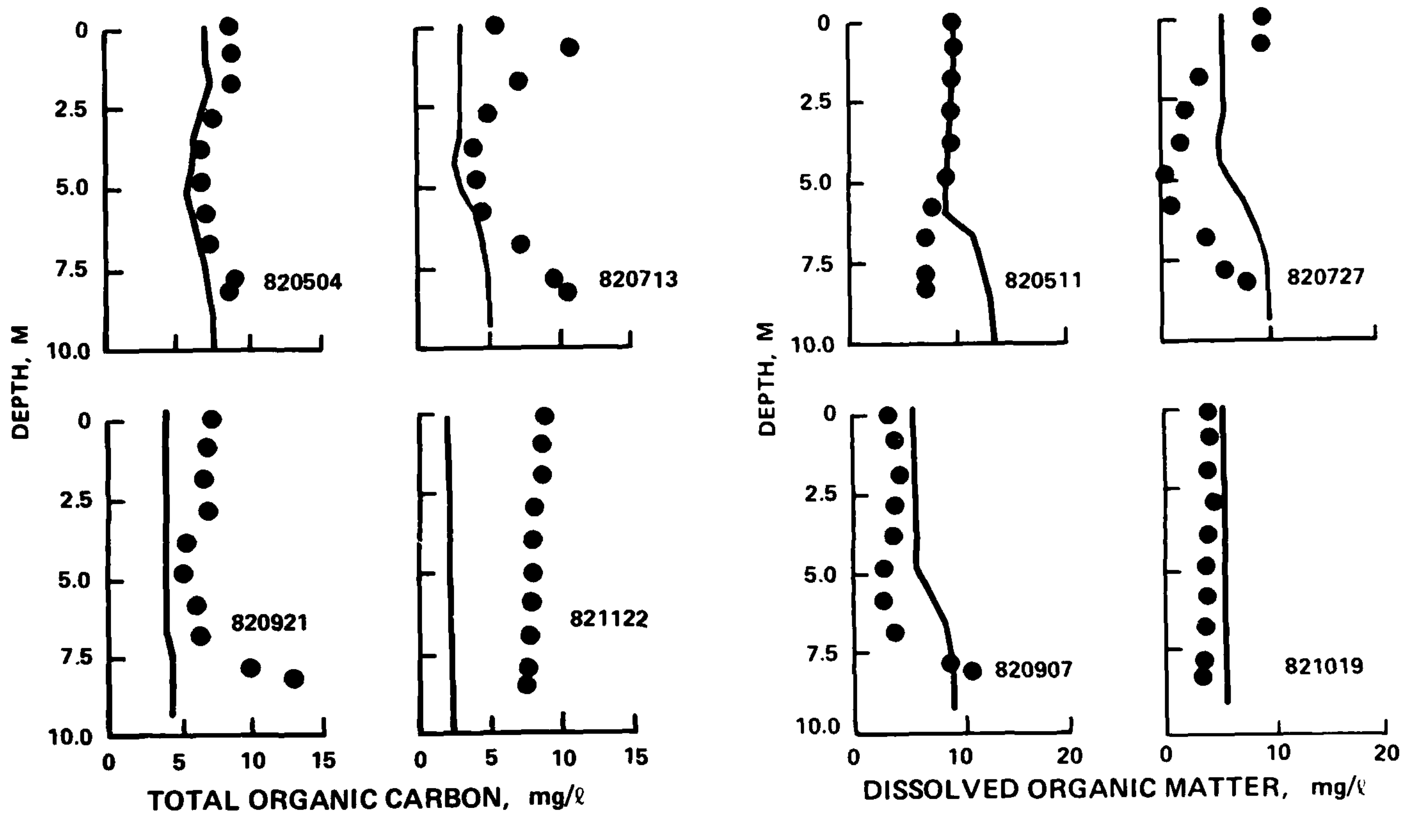


Figure 12. (Sheet 2 of 10)



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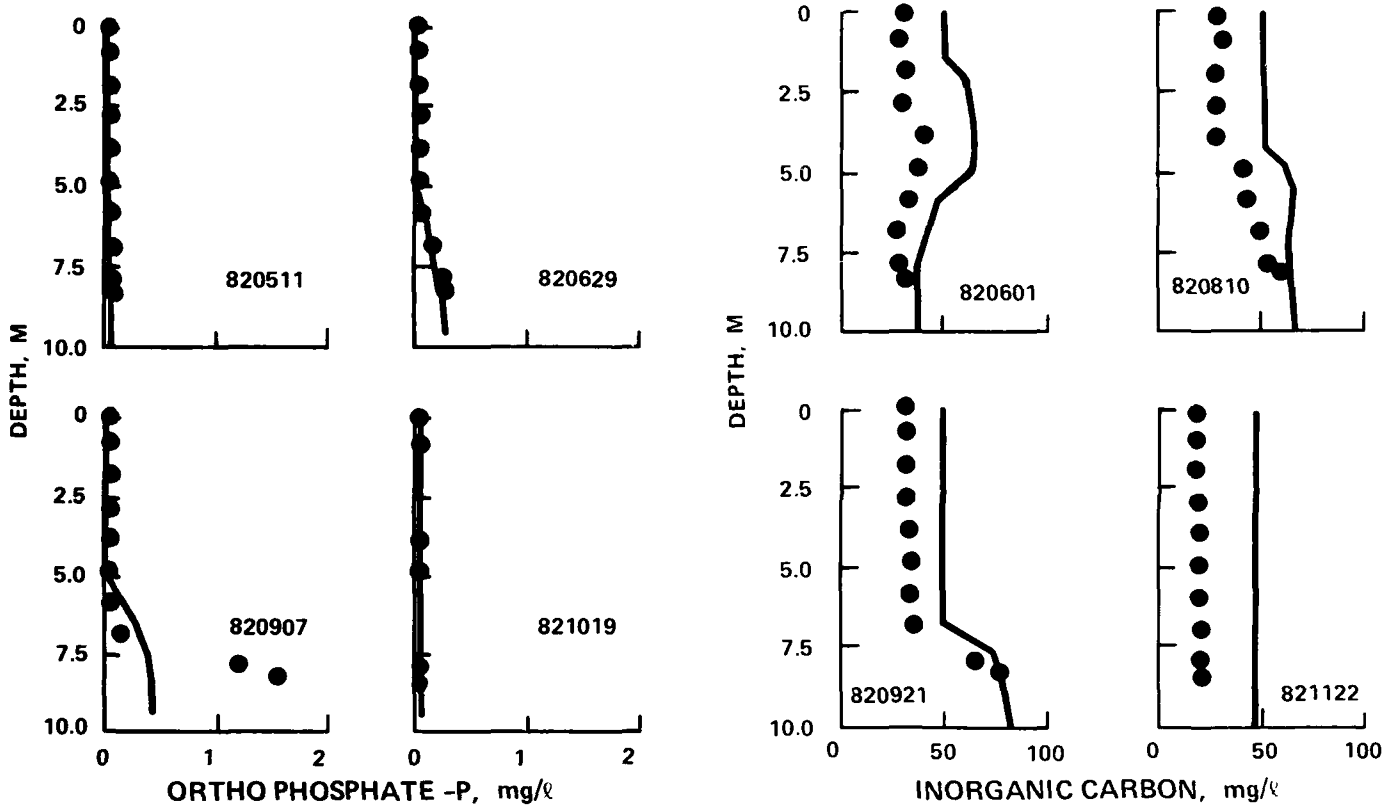

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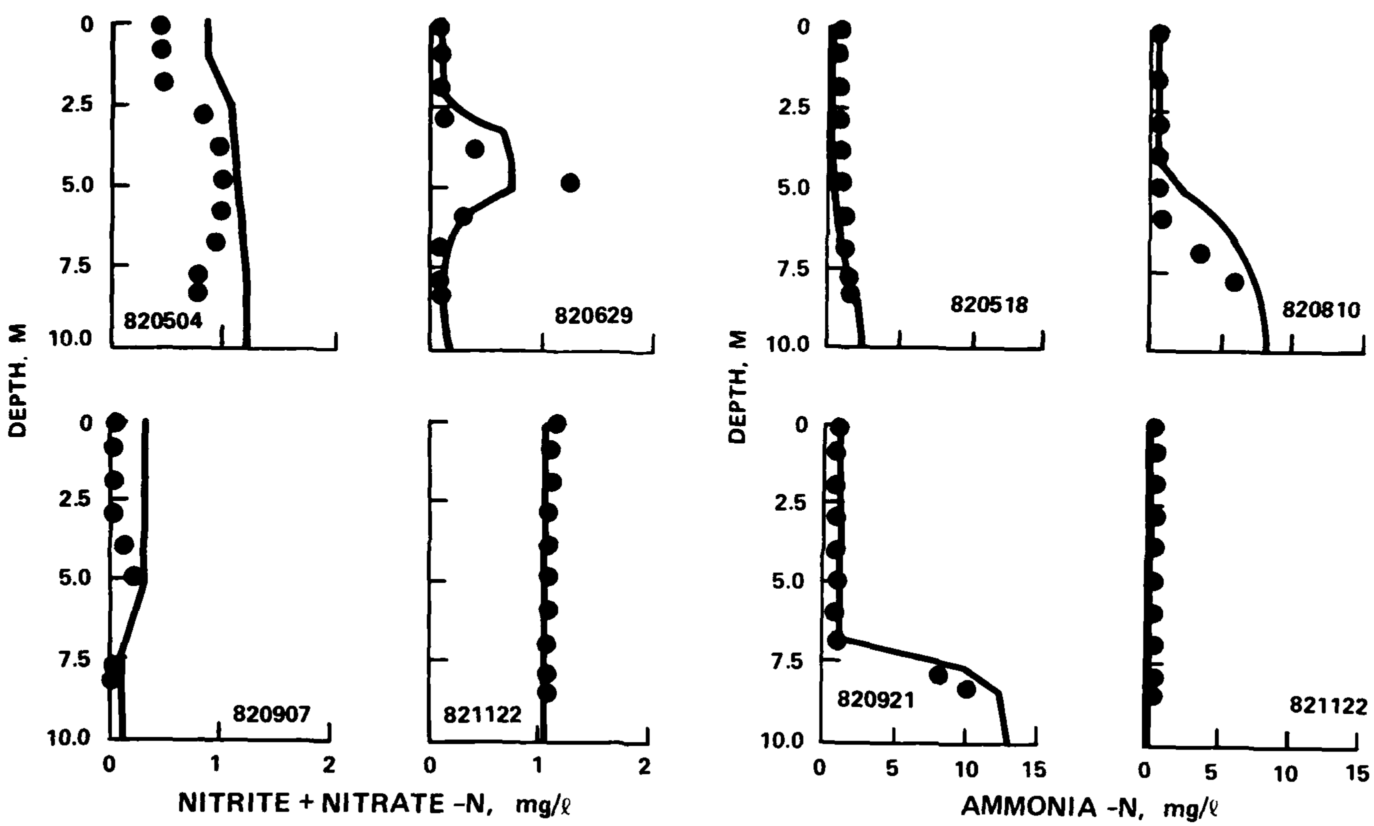

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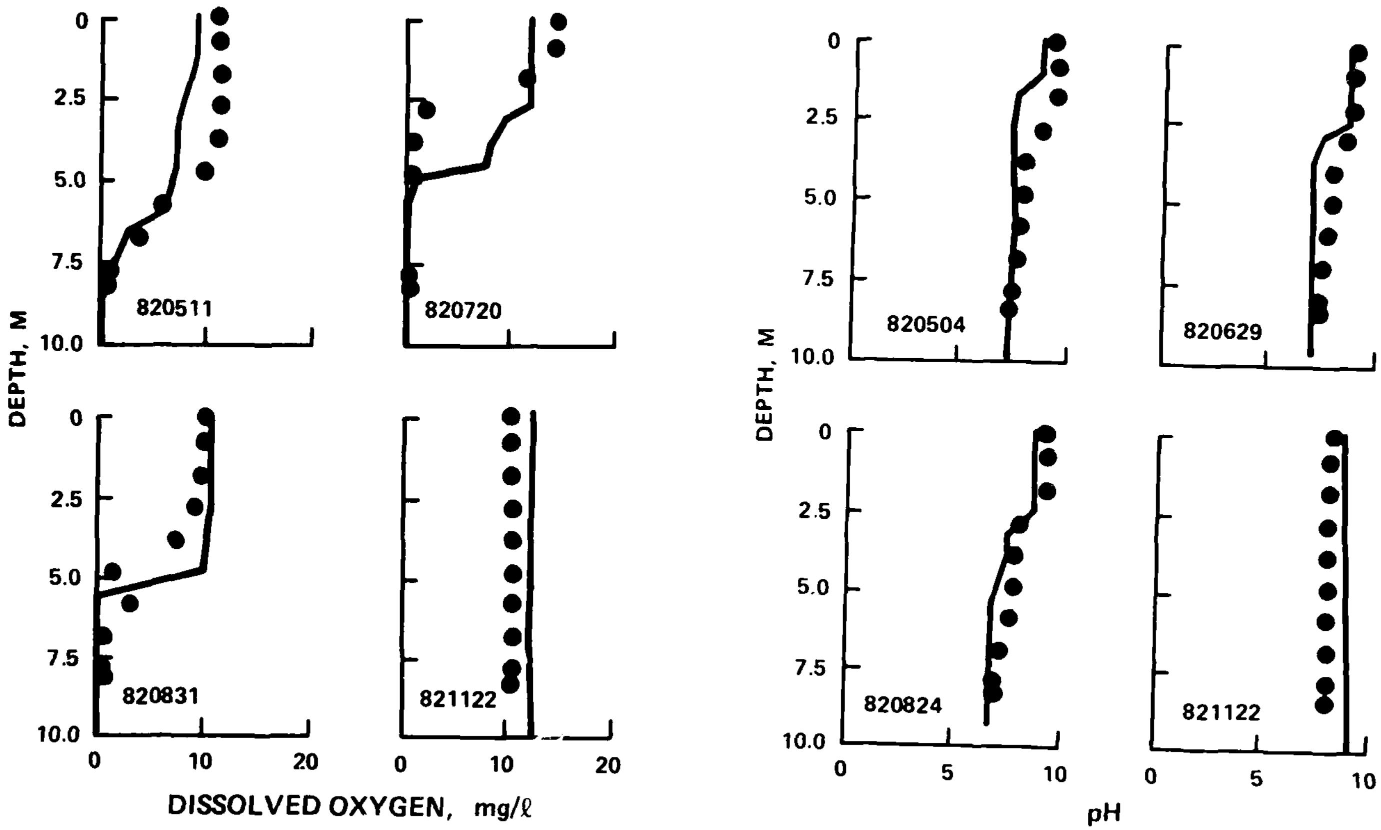

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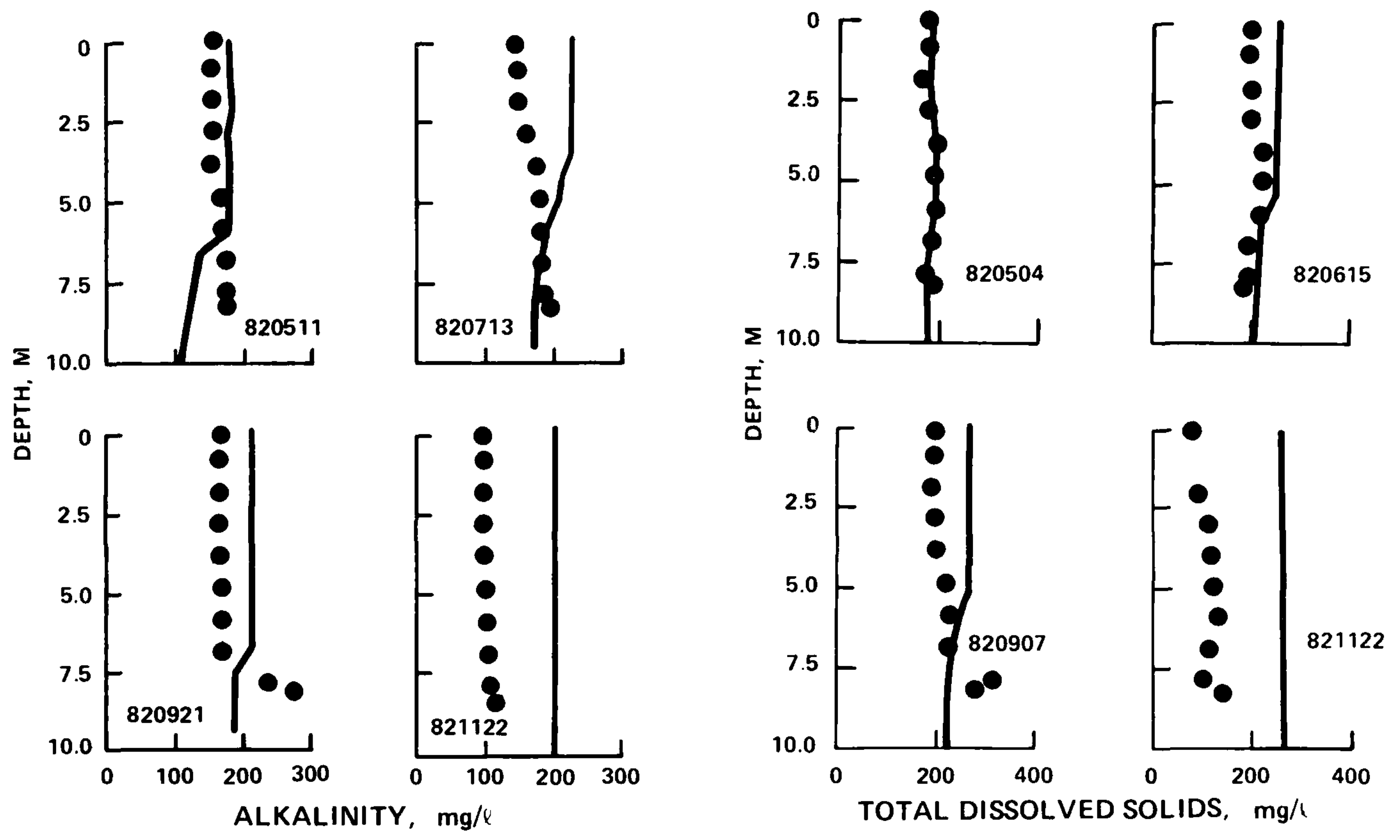

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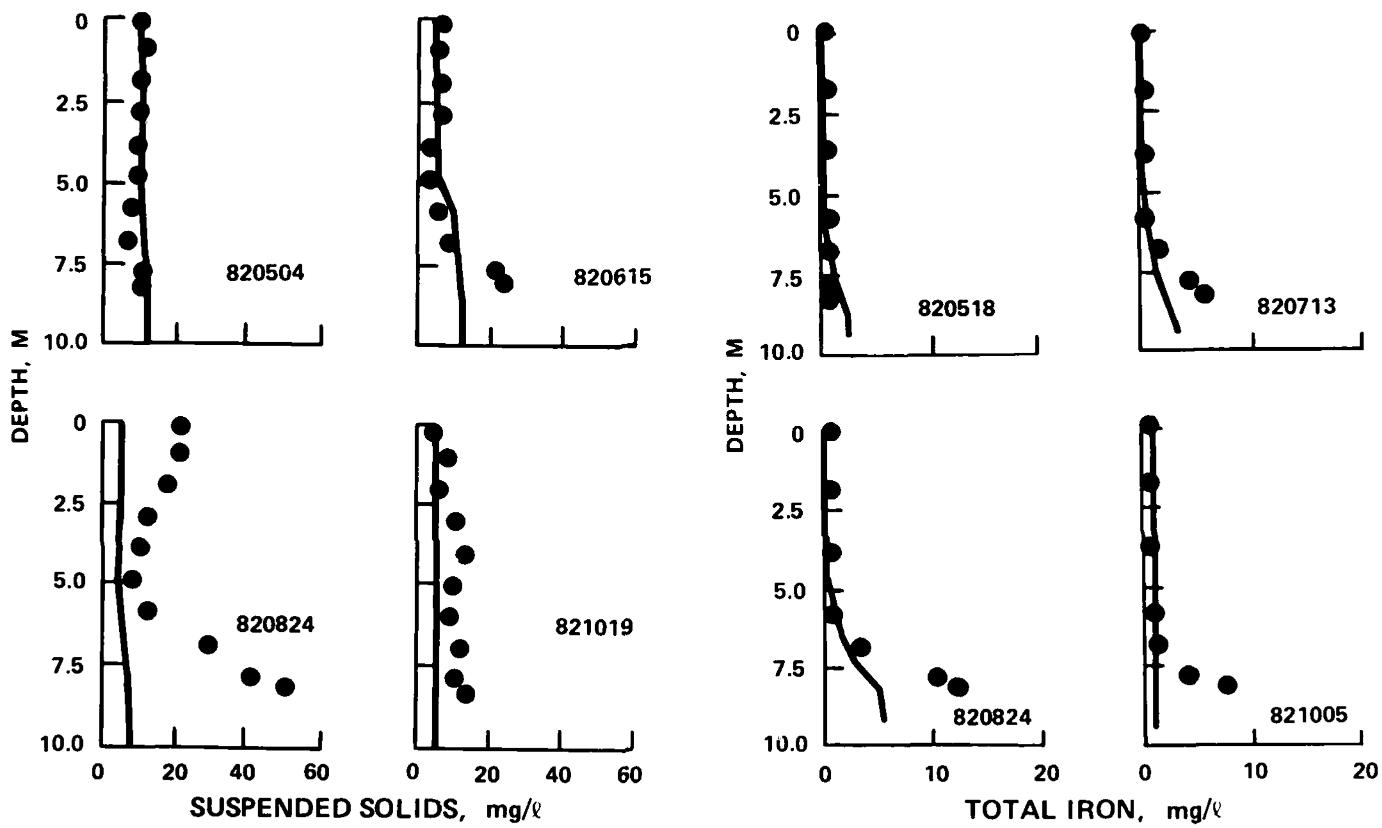

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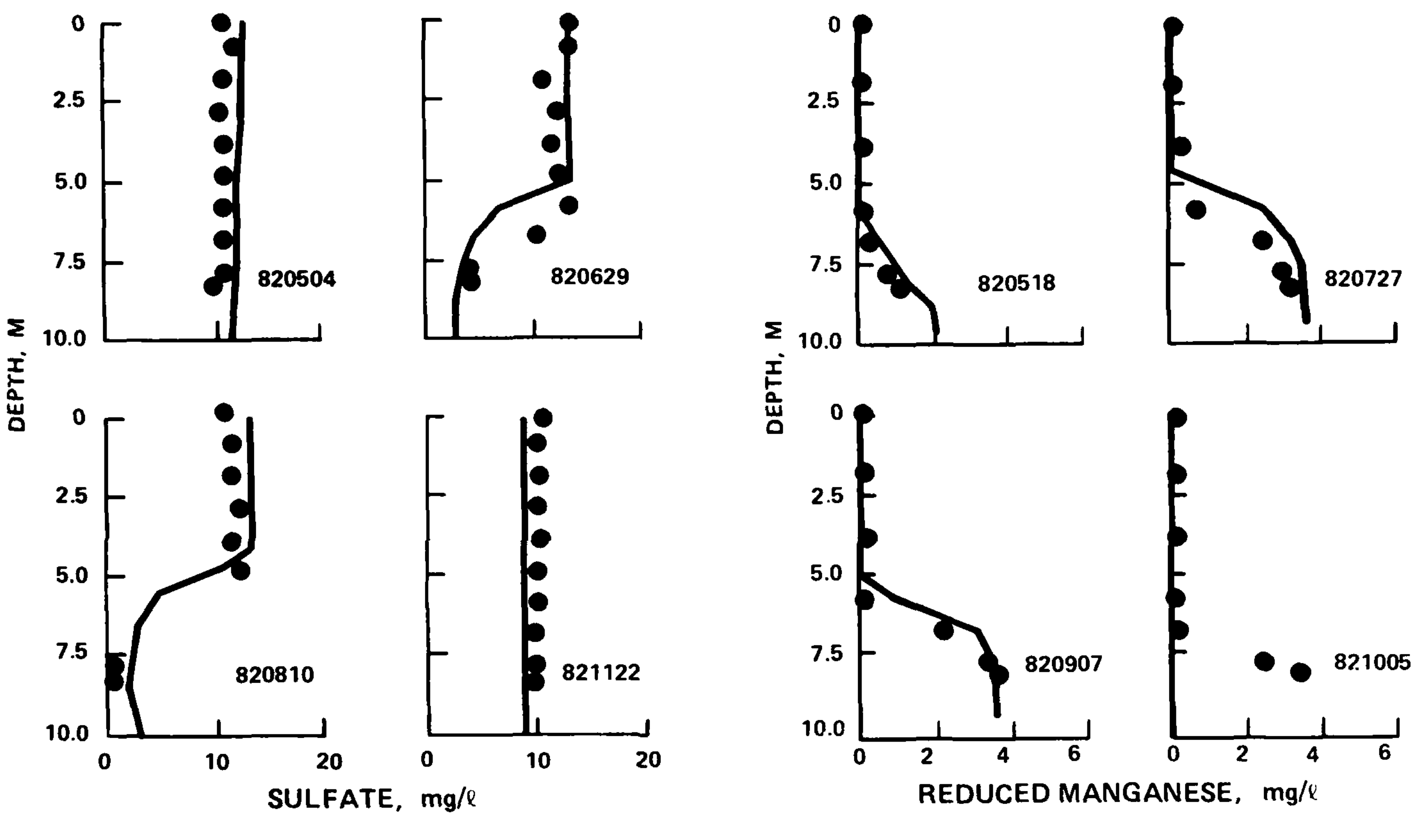

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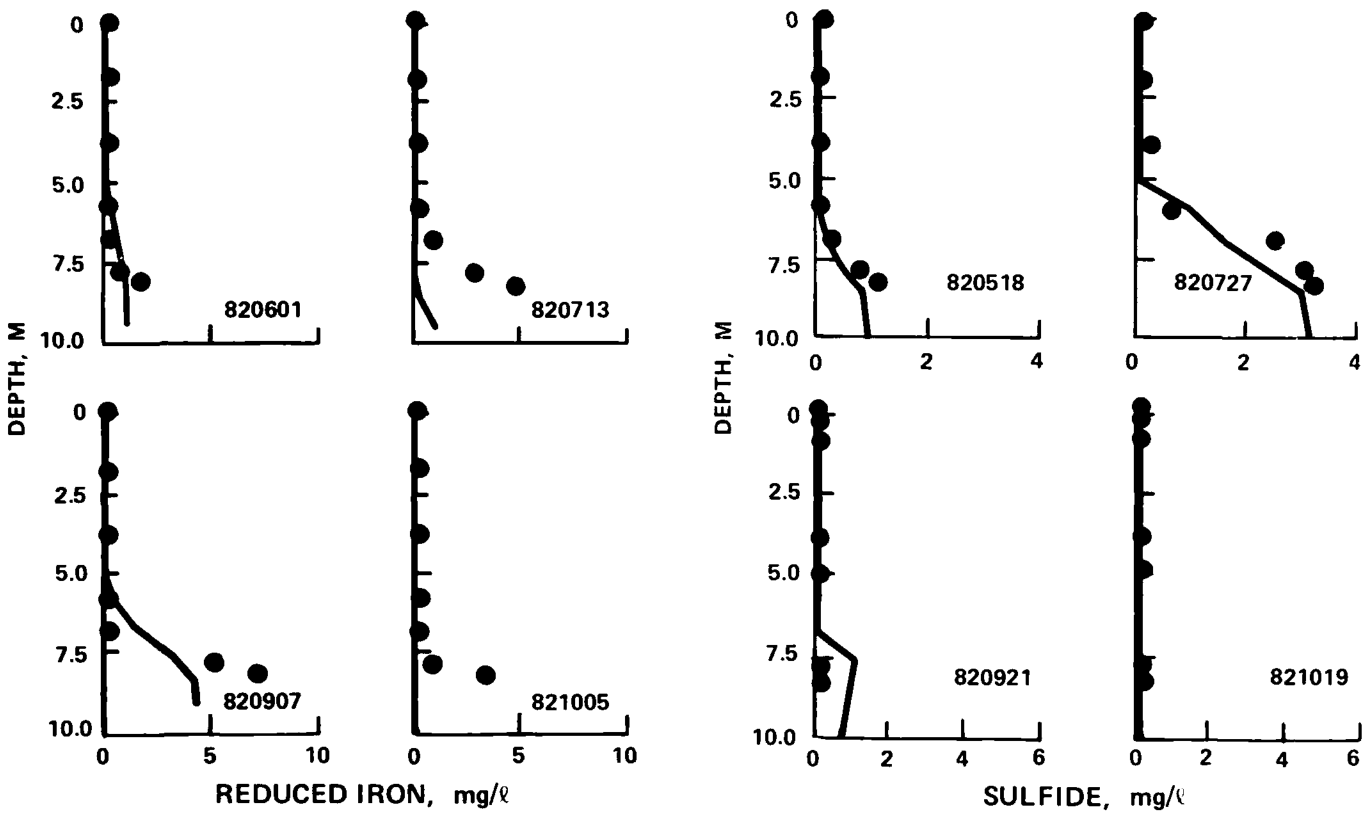

Figure 12. (Sheet 10 of 10)

conditions, which themselves cannot be accurately transferred from the meteorological station to the site.

57. The maxima for nitrite plus nitrate and the minima for dissolved organic carbon and total organic carbon occurred in 1982 similar to 1981. Although these phenomena were again predicted by the model, the concentrations were not as accurate as the 1981 predictions. Unlike 1981, sulfate concentrations in the epilimnion remained around 10 mg/ℓ through the summer and fall, with excellent predictions being made by the model. For sulfate, the RI for 1982 was 1.86, compared to 3.41 for 1981.

58. The above results have a bearing on possible uses of the model. In the case of preimpoundment studies, because unsatisfactory results were obtained from the initial calibration simulation, results would be questionable unless real data were available from similar impoundments nearby. Johnson and Ford (1981) confirmed the model (CE-THERM-R1) in this manner on DeGray Lake and Lake Greeson in Arkansas, and obtained excellent results. To date, the same type of confirmation exercise has not been made for the full CE-QUAL-R1 model. In addition, the range of results obtained when using wind data from two different stations for the Eau Galle simulation leads to the recommendation that both preimpoundment and postimpoundment studies include simulations using meteorological data for a number of different years. Furthermore, because of differences between reservoirs, minor changes to the computer code may have to be made to address a specific problem.

Time Steps

59. One of the features of CE-QUAL-R1 is a variable time step, allowing the user to choose from 1-, 2-, 3-, 4-, 6-, 8-, 12- or 24-hr periods. Shorter time steps should show some of the dynamics occurring during a 1-day time period, although simulations would be more expensive. All of the simulations for evaluating the model while using data collected on DeGray Lake, as well as other work reported here, used 24-hr time steps. To test the model using periods other than 24 hr, a

number of simulations were made using a 3-hr time step. The first simulation used the 1981 calibration data set from Eau Galle, without any changes to coefficients. In addition, the same set of driving variables was used. The model simply interpolated the 24-hr data to supply values for 3-hr periods. It would have been more appropriate to supply data measured at 3-hr intervals.

60. The results were not at all satisfactory, indicating that the same set of coefficients cannot be used with different time steps. This problem is probably due to the nonlinearity of some equations. After a number of calibration simulations were made, reasonable results were obtained. To produce satisfactory results for the calibration simulation using 3-hr time steps, eight coefficients had to be changed. These were the mixing coefficient due to wind, the light saturation and maximum gross production coefficients for the three algal compartments, and the zooplankton ingestion coefficient. Although the predictions for macrophytes were not checked, it seems reasonable that for different time steps, the macrophyte gross production and light saturation coefficients should also be changed. The RI for the final 3-hr simulation was 2.69, although only a few calibration runs were made compared to the 24-hr time step. It is recommended that once the model has been calibrated for a set of coefficients and time step, the time step should not be changed.

Flux Predictions

61. Wlosinski (1979), Scavia (1980), Chapra et al. (1983), and Collins and Wlosinski (1984) have shown the need to compare predicted and measured flux values in addition to mass or concentration values. Evaluating models by concentrating solely on the comparison of measured versus predicted concentrations can produce a model that predicts reasonable concentrations for the wrong reasons. As part of the Eau Galle Reservoir study, a number of process rates were measured which could be compared to model predictions. These included algal productivity, sediment oxygen demand, and sedimentation rates of algae.

62. Productivity rates vary extensively over a 24-hr period and from day to day, and are dependent on local conditions such as light, temperature, and the concentrations of nutrients and algae. Nevertheless, comparisons should show rates that are similar. Production rates were measured from noon until 2 pm at discrete intervals between the surface and 3 m on a biweekly sampling schedule. The measured values of mg $O_2/m^2/hr$ were converted to g $O_2/m^2/day$, assuming a 10-hr photosynthetic day, for comparison with predicted values. The comparison, shown in Figure 13, used predictions from an approximate depth of 2 m. It must be remembered that algal processes and rate values used in the model are based upon average daily values. Studies have revealed that photosynthetic capacity, cell division, nutrient uptake, respiration, and grazing vary according to algal circadian rhythms (Prezelin et al. 1977; Chisholm, Azam, and Eppley 1978; and Chisholm 1981). Considering the variability in measured data at different stations and the fact that the measured data are for a much shorter period than the 24-hr time step used, predictions are quite reasonable.

63. Sedimentation rates of algae were also available. Sediment

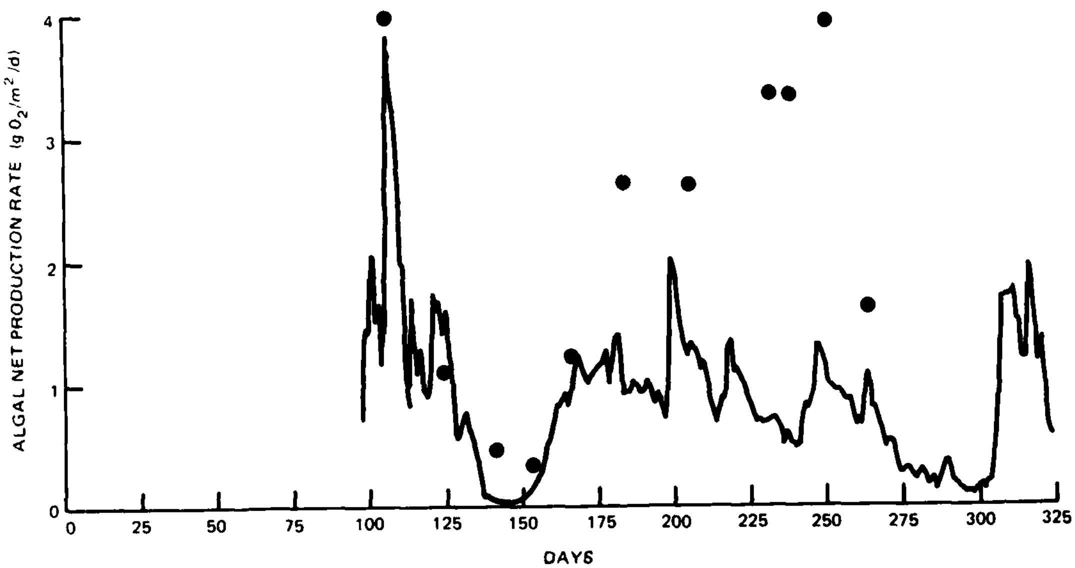

Figure 13. Algal net production rates for Eau Galle Reservoir, 1981, station 20. Circles represent observed rates from 0-3 m; the solid line represents predicted rates at approximately 2 m

traps were deployed at 4 and 8.5 m below the water surface and were retrieved after approximately 2 weeks. Direct comparison of predicted and measured values was not possible because of the variable layer scheme employed in the model. The model predicts values on a per-layer basis, and because the thickness of each layer is variable, the 4- or 8.5-m depth contour may be located in different layers during different time steps. For comparative purposes, the predictions from layer 4 (Figure 14) and layer 8 (Figure 15) were used. In general, the predictions were more uniform than the measured data, and except in June at 4 m, the model predictions were lower than measured values. Part of the difference may be due to the fact that as algae settle in the model, their mass is lost to the nutrients, labile dissolved organic matter, and detritus through respiration and mortality, whereas chlorophyll a in the system decomposes more slowly and may be measured at deeper depths even though the cells are not viable. Most of the values are close enough to be considered reasonable, especially when compared to earlier predictions that were an order of magnitude different than measured values.

64. Sediment oxygen demand was measured in the laboratory on sediment collected from Eau Galle Reservoir (Gunnison, Chen, and Brannon 1983). The dissolved oxygen depletion rate was 176 $mg/m^2/day$ at 20° C, which was converted to modeled units of 32 kg/layer/day. In making this conversion, predictions from layer 4 were used, which has an area of 183,000 m^2. Predicted sediment oxygen demand varies extensively over the year, but usually ranges from near 0 to 120 kg/layer/day (Figure 16). The major differences seen are a function of temperature.

65. A detailed evaluation of all processes and constituents involved in dissolved oxygen production and consumption indicates that algal production (Figure 17) and macrophyte production (Figure 18) evolved more oxygen which was consumed by chemical and biological processes. The consuming processes include: algae, macrophyte, zooplankton, and fish respiration; decomposition of sediment, detritus, and dissolved organic matter; ammonia decay; and anaerobic oxidation (Table 3). Correct predictions of anaerobic conditions were made despite the prediction of greater oxygen production versus utilization.

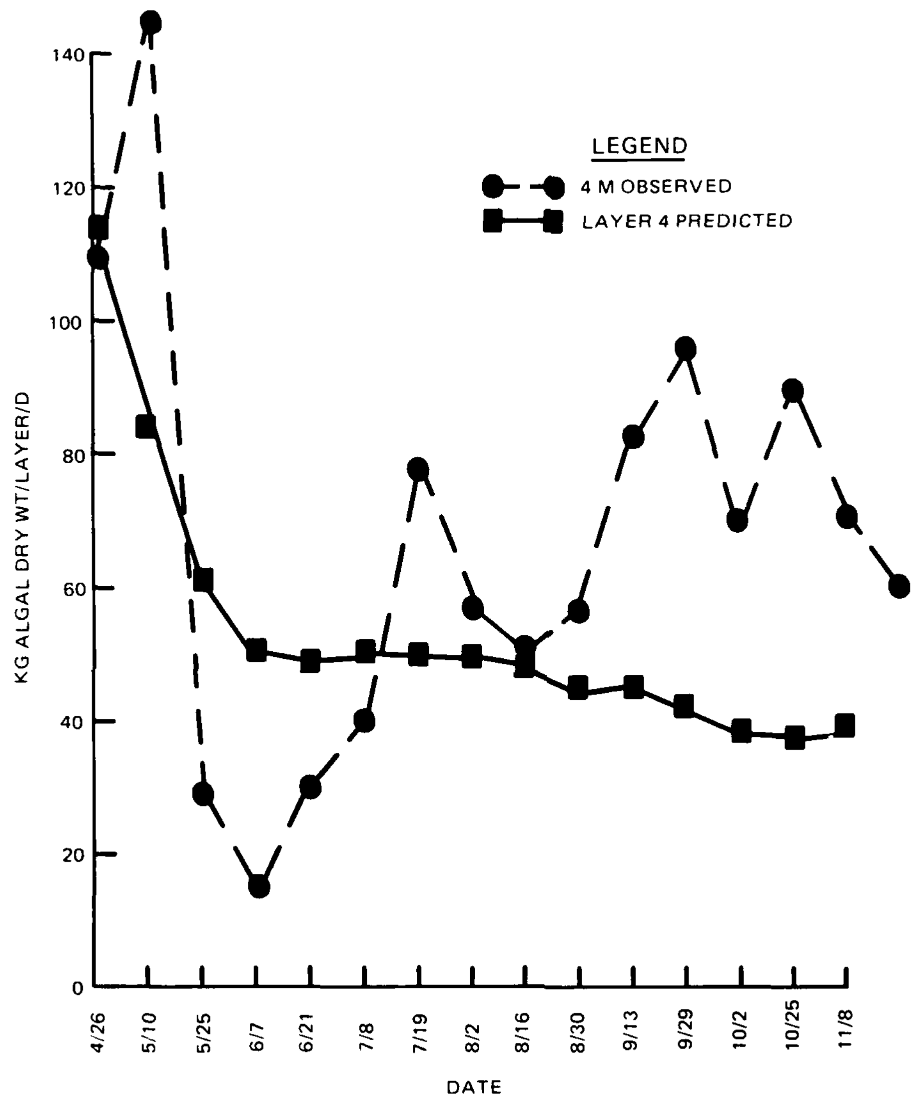

Figure 14. Algal dry weight sedimentation rates for Eau Galle Reservoir, 1981, station 20. Circles represent observations at 4 m, and squares represent predicted rates for layer 4

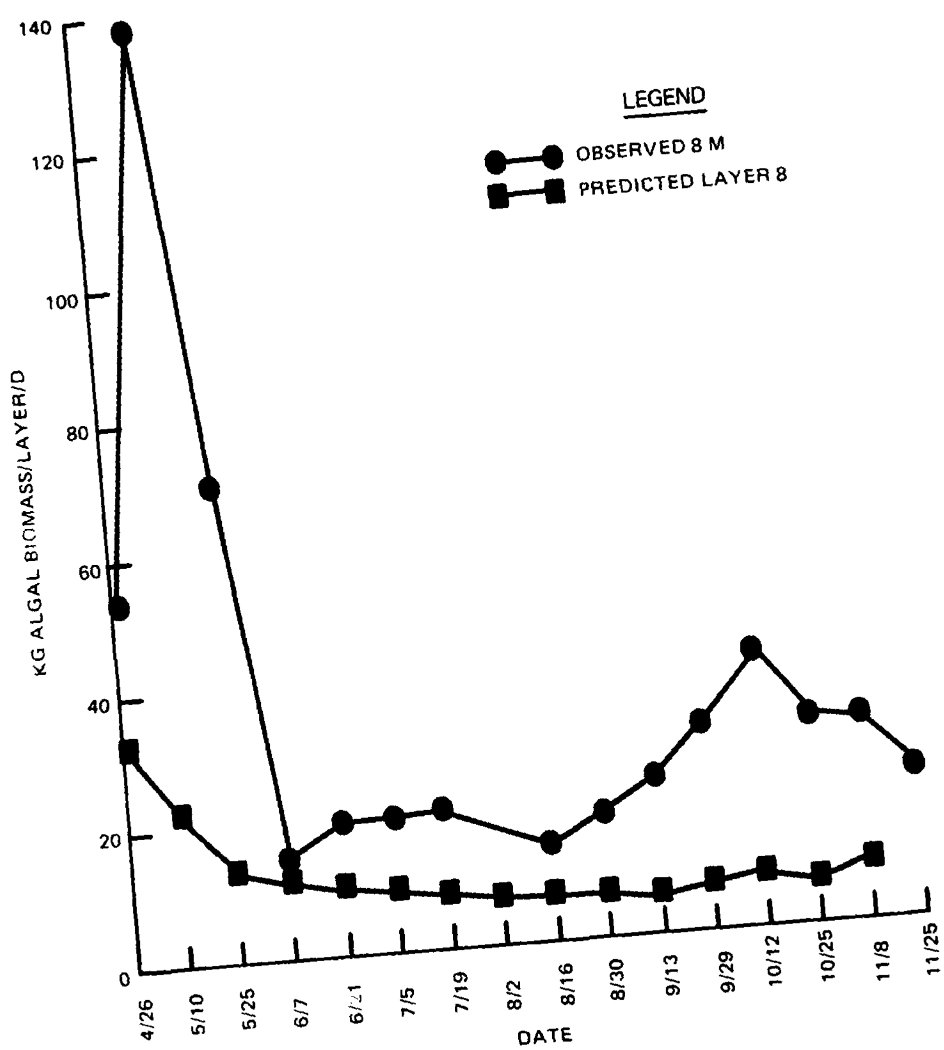

Figure 15. Algal dry weight sedimentation rates for Eau Galle Reservoir, 1981, station 20. Circles represent observations at 8.5 m, and squares represent predicted rates for layer 8

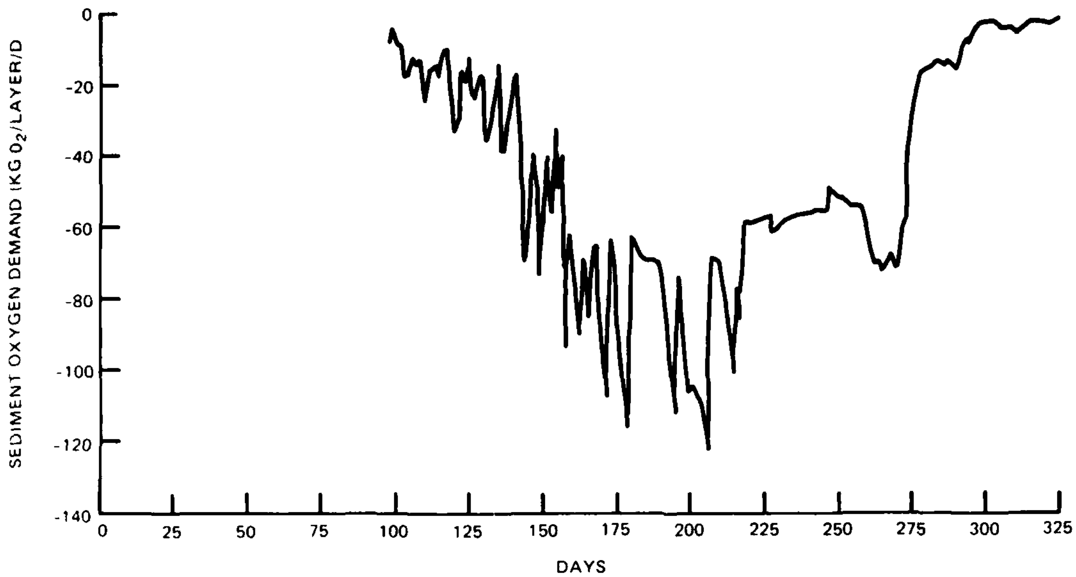

Figure 16. Sediment oxygen demand predicted for Eau Galle Reservoir, 1981, for layer 4

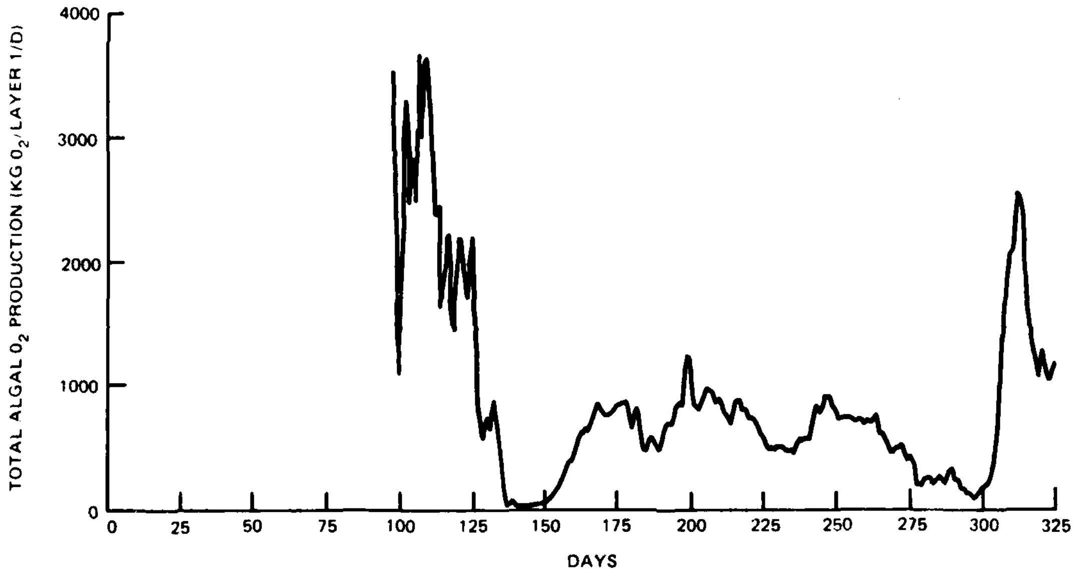

Figure 17. Oxygen production by algae for the surface layer in 1981

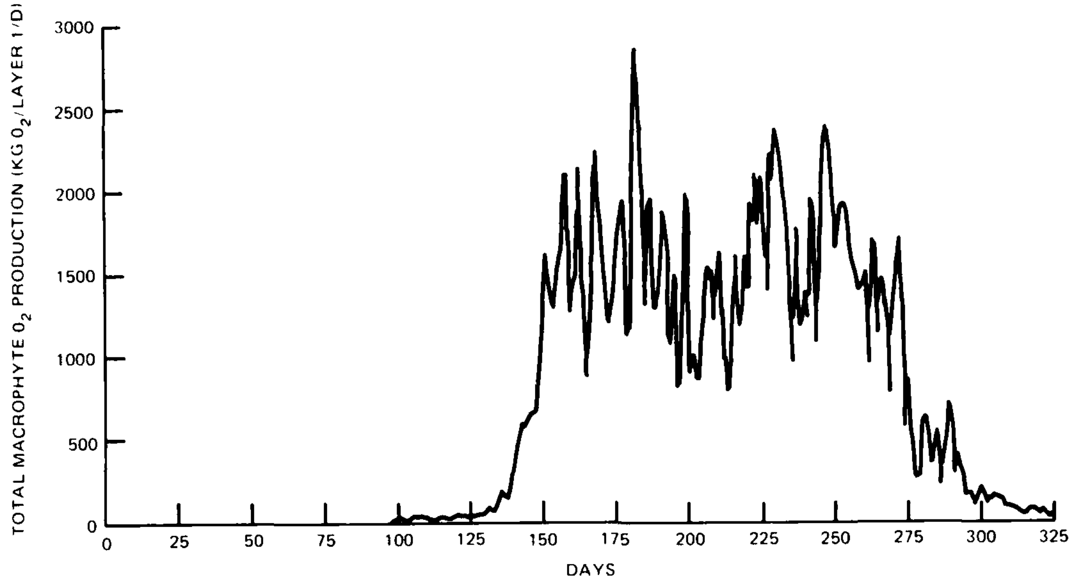

Figure 18. Oxygen production by macrophytes for the surface layer in 1981

This occurred because the majority of oxygen was produced above the metalimnion, and oxygen diffused more rapidly to the atmosphere than through the thermocline. The net flux of oxygen at the air-water interface was out of the system and was 0.14×10^6 kg for the entire simulation. Daily predictions of this exchange are shown in Figure 19.

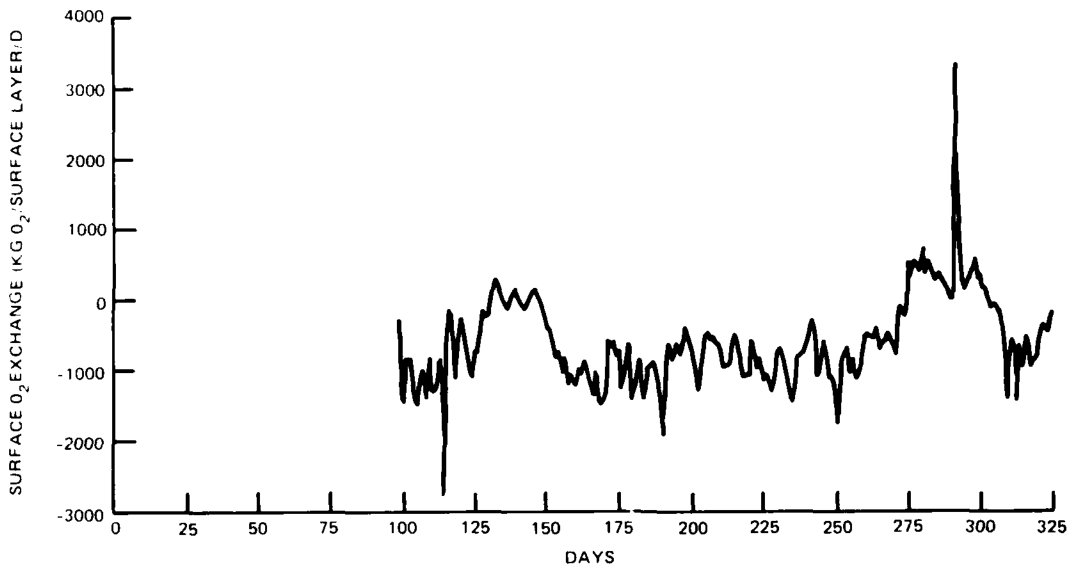

Figure 19. Predicted exchange of oxygen at the air-water interface for Eau Galle Reservoir, 1981. Negative fluxes represent oxygen leaving the system

PART V: SUMMARY AND CONCLUSIONS

66. Simulation of Eau Galle Reservoir was the final step, during the EWQOS Program, in developing the water quality model CE-QUAL-R1. Evaluation has included tests of the code to ensure that computer programming was correct, as well as comparisons of model predictions to field measured values. Tests of the code included evaluations of the stability of predictions, conservation of mass, time step comparisons, entries of initial values, comparisons using different driving variables, and a check of equation dimensionality (Wlosinski and Collins 1985).

67. Two data sets (DeGray Lake, Ark., and Eau Galle Reservoir, Wis.) were collected specifically to evaluate model predictions. The two reservoirs differed markedly in size, shape, location, withdrawal structure, and biological attributes. Evaluation of model predictions and field measured values included both graphical and statistical comparisons. The confirmation simulation for DeGray Lake had an average RI of 2.59 (Wlosinski and Collins 1985), and for Eau Galle Reservoir, 2.62. This is a major step over the once "accepted" modeling phrase of "acceptable within an order of magnitude," which was used for algae and nutrients. All variables for the confirmation exercises had RI values under 5.0. In addition to comparisons of the concentrations of variables, a number of flux values were also investigated for the two reservoirs, and all were considered acceptable. This helps ensure that variable concentrations were predicted for the correct reasons. This is necessary when the model is to be used for comparing different engineering strategies.

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Table 1

Statistical Results from the 1981 Final Calibration Simulation of Eau Galle Reservoir

Variable	Unit	Number of Dates	Number of Comparison	Observed Mean	Predicted Mean	Reliability Index
Temperature	°C	32	320	13.9	14.3	1.09
Chlorophyll a	µg/ℓ	16	159	38.4	28.3	3.05
Silica	mg/ℓ	16	160	6.05	9.19	1.97
Total manganese	mg/ℓ	14	140	1.00	0.90	4.27
Total organic carbon	mg/ℓ	16	160	7.80	6.13	1.35
Dissolved organic carbon	mg/ℓ	16	160	11.5	11.4	1.32
Orthophosphate phosphorus	mg/ℓ	16	160	0.049	0.053	4.84
Ammonia nitrogen	mg/ℓ	16	160	0.86	0.74	4.85
Nitrate plus nitrite nitrogen	mg/ℓ	16	160	0.25	0.39	2.69
Oxygen	mg/ℓ	32	320	7.0	8.1	2.39
pH	N/A	32	319	8.11	8.06	1.07
Alkalinity	mg/ℓ	16	160	164.0	161.0	1.26
Total dissolved solids	mg/ℓ	16	160	203.0	239.0	1.24
Suspended solids	mg/ℓ	16	160	17.0	9.1	2.05
Total iron	mg/ℓ	14	140	1.4	1.5	2.86
Sulfate	mg/ℓ	16	160	5.1	6.7	3.41
Reduced manganese	mg/ℓ	13	130	0.69	0.85	3.45
Reduced iron	mg/ℓ	14	140	0.49	0.82	3.07
Sulfide	mg/ℓ	14	140	0.17	0.38	2.62
Average						2.57
Total			3,408			

Table 2

Statistical Results from the 1982 Final Calibration Simulation of Eau Galle Reservoir

Variable	Unit	Number of Dates	Number of Comparison	Observed Mean	Predicted Mean	Reliability Index
Temperature	°C	28	277	14.8	15.1	1.14
Chlorophyll a	μg/ℓ	14	138	23.5	19.4	3.25
Silica	mg/ℓ	17	170	7.3	8.9	1.74
Total manganese	mg/ℓ	12	84	1.02	1.52	4.16
Total organic carbon	mg/ℓ	18	180	7.54	4.66	1.75
Dissolved organic carbon	mg/ℓ	18	180	5.58	8.64	1.92
Orthophosphate phosphorus	mg/ℓ	18	175	0.101	0.056	3.54
Inorganic carbon	mg/ℓ	13	130	32.2	50.4	1.73
Ammonia nitrogen	mg/ℓ	18	179	0.85	0.99	4.81
Nitrate plus nitrite nitrogen	mg/ℓ	18	179	0.34	0.61	3.16
Oxygen	mg/ℓ	28	277	5.8	8.8	2.92
pH	N/A	28	277	8.01	8.13	1.06
Alkalinity	mg/ℓ	18	178	164.0	187.0	1.38
Total dissolved solids	mg/ℓ	16	157	197.0	241.0	1.40
Suspended solids	mg/ℓ	16	158	10.8	7.1	2.18
Total iron	mg/ℓ	12	84	2.1	1.0	2.20
Sulfate	mg/ℓ	16	157	9.9	11.1	1.86
Reduced manganese	mg/ℓ	12	84	0.94	1.3	3.30
Reduced iron	mg/ℓ	11	77	1.2	0.33	4.14
Sulfide	mg/ℓ	11	110	0.05	0.76	4.85
Average						2.62
Total			3,251			

Table 3

Eau Galle 1981 Oxygen Budget*

Process	Oxygen Production	Oxygen Utilization
Algal photosynthesis	0.1945×10^6	
Macrophyte photosynthesis	0.2135×10^6	
Algal respiration		0.4734×10^5
Macrophyte respiration		0.8863×10^5
Zooplankton respiration		0.2815×10^5
Fish respiration		0.6555×10^4
Ammonia decay		0.4152×10^4
Detritus decomposition		0.5678×10^4
Sediment decomposition		0.1218×10^6
Labile DOM decomposition		0.2373×10^5
Refractory DOM decomposition		0.6165×10^4
Anaerobic oxidation		0.3762×10^3
Total oxygen produced	0.4080×10^6	
Total oxygen utilized		0.3325×10^6

* Units are kilograms/reservoir/227 days.

APPENDIX A: EAU GALLE DATA SETS FOR 1981 AND 1982

```
TITLE               EAU GALLE 1981
TITLE     ST PAUL MET.SOME EAU CLAIRE WIND.NO OUTFLOW IN HOLE.
TITLE      WEIR OUTFLOW. BURM AT 6.1 FOR TRIB INFLOW.
TITLE      NEW IN +OUTFLOW CALC.+DEPTH AREA RELATHIONSHIP
TITLE     WLOSINSKI JUNE 4 84 #1
JOB            13      324       24    99999       97       81        3        1
OUTPUT   COMPLETE
PHYS1           1        2        9     44.8     92.3      1.7        0  1.2-09
PHYS2         850       .4      1.2
PHYS2+       1.15     1.15     1.15     1.15     1.15      1.0      1.0      1.0      1.0
STRUCT    PORT+WEIR
CHOICE   SPECIFIED
PHYS3         4.1     1.08     1.08
WEIR          7.6     9.75      3.2
PHYS4       5791.   1.9543
PHYS5       251.8    .2528
MIXING       .007     .004   .00009  .000200      2.0
LIGHT         .80      .45      .10
DIFC2     5.40-10  7.50-09
ALG1          .38      .40     .004      .34
ALG2          .99     0.05     .020      .06     0.10      85.      .05      .07     .140
ALG3         1.40     0.10     .020      .09      0.1     115.     .040     .060      .17
ALG3A        1.60     0.12     .004      .07      .08      45.      .04      .01     .145
ALG3++        .05
ALG4           7.       15       28       35      0.1      0.1
ALG5           12      19.      25.      35.      0.1      0.1
ALG5+           0        8       12      17.      0.1      0.1
PLANT1        .42     .050     .012     .030       .2       .4       .4      1.5
PLANT2        .04      .10      .01     .005      40.      95.      .55      1.8
PLANT3         7.      21.      24.      34.       .2       .2
ZOO1          .99     .011     .650      .15      .25      .30      .30     0.20      .20
ZOO2          .50      2.0       12       26       36      0.1      0.1
DET1          .15      4.0       22     0.01
FISH1       .0180       .2      .03      .15      .15      .15      .37      .15
FISH2          1.     24.4     28.4     35.2       .1       .1       .8      .01      .01
DECAY1      0.040     0.01    0.020      1.4    .0012    .0010     .050       .3      .07
DECAY2         4.       22      .12
DECAY3         2.      32.      0.1
DECAY4         2.      32.      0.1
SSETL         .05      30.      40.    .0025     .005
TMP          1.04
CHEM         4.57     1.14      1.4      1.1      1.4      1.4     0.15     0.14      2.0
ANAER1         .5      5.0
ANAER2       0.14     0.16        0        5       35       40      0.1      0.1
ANAER3       0.35        0        5       35       40      0.1      0.1
ANAER4        .60        0        5       35       40      0.1      0.1
ANAER5       0.04     0.02        0        5       35       40      0.1      0.1
ANAER6        .45        0        5       35       40      0.1      0.1
ANAER7        .60     0.05        0        5       35       40      0.1      0.1
ANAER8       0.40        0        5       35       40      0.1      0.1
ANAER9       0.50      0.6        0        5       35       40      0.1      0.1
ANAER10     0.040        0        5       35       40      0.1      0.1
ANAER11       .01        0        5       35       40      0.1      0.1
ANAER12      0.50     0.05        0        5       35       40      0.1      0.1
ANAER13     0.014        0        5       35       40      0.1      0.1
ANAER14      0.40        0        5       35       40      0.1      0.1
INIT0           9
INIT1         55.
INIT2         0.0      .00      .00     109.              .052     .682      0.0     300.
INIT3         2.4     19.3     12.7     .110    5001.      5.8     157.       .1      8.0
```

```
INIT4        24.6     0.1      0.1      1.1      0.1      0.0      9.1      0.0    220.
INIT5       1310.     0.       1.6    102.     1210.     2.77     5.52
INIT2        2.59     .00      .00    109.               .052     .682     0.0    300.
INIT3         2.4    19.3     12.7     .110    5001.      5.8    157.       .1      8.0
INIT4        24.6     0.1      0.1      1.1      0.1      0.0      9.1      0.0    220.
INIT5       1310.     0.       1.6    102.     1210.     2.77     5.52
INIT2        3.59     .00      .00    108.               .043     .671     0.0    300.
INIT3         2.4    21.1     12.7     .110    5001.      5.8    167.       .1      8.0
INIT4        23.4     0.1      0.1      0.8      0.1      0.0      9.1      0.0    220.
INIT5       1310.     0.       1.6    102.     1210.     2.77     5.85
INIT2        4.59     .00      .00    109.               .044     .663     0.0    300.
INIT3         2.4    20.9     12.8     .110    5001.      5.8    159.       .1      8.1
INIT4        23.4     0.1      0.1      0.8      0.1      0.0      7.1      0.0    220.
INIT5       1310.     0.       1.6    102.     1210.     2.77     5.85
INIT2        5.59     .00      .00    109.               .045     .666     0.0    300.
INIT3         2.4    20.7     13.0     .110    5001.      5.9    161.       .1      8.1
INIT4        23.4     0.1      0.1      1.0      0.1      0.0      9.1      0.0    220.
INIT5       1310.     0.       1.6    102.     1210.     2.77     5.85
INIT2        6.59     .00      .00    109.               .037     .658     0.0    300.
INIT3         2.4    21.5     13.1     .110     501.      5.9    162.       .1      8.1
INIT4        24.0     0.1      0.1      1.0      0.0      0.0      9.1      0.0    220.
INIT5       1310.     0.       1.6    102.     1210.     2.77     5.88
INIT2        7.59     .00      .00    108.               .040     .659     0.0    300.
INIT3         2.4    21.8     13.2     .110     501.      6.0    159.       .1      8.1
INIT4        24.6     0.1      0.1      1.0      0.1      0.0      8.9      0.0    220.
INIT5       1310.     0.       1.6    102.     1210.     2.77     5.82
INIT2        8.59     .00      .00    109.               .033     .656     0.0    300.
INIT3         2.4    20.2     13.3     .110     501.      6.0    165.       .1      8.2
INIT4        24.6     0.1      0.1      1.2      0.1      0.0      8.4      0.0    220.
INIT5       1310.     0.       1.6    102.     1210.     2.77     6.10
INIT2        9.59     .00      .00    110.               .051     .654     0.0    322.
INIT3         2.4    20.4     13.2     .110     501.      6.0    158.       .1      8.2
INIT4        24.3     0.1      0.1      1.1      0.1      0.0      9.3      0.0    220.
INIT5       1310.     0.       1.6    102.     1210.     2.77     5.95
PLANTS         8.      8.       8.
FILES    PLTWC    EG812    EG813    EG814    FLUX
ID       EAU GALLE 1981 JUN  4 84 #1
FILES          24     353
W2 STPAL 81 113        .2     -6.1     -9.8    980.5     11.8
W2 STPAL 81 114       1.0     -4.2     -8.1    982.5     15.5
W2 STPAL 81 115        .4    -12.2    -18.8    989.9     21.5
W2 STPAL 81 116        .1    -13.3    -19.2    999.2     14.6
W2 STPAL 81 117        .5     -5.3    -12.6    995.5     19.4
W2 STPAL 81 118        .2      -.8     -7.8    991.8     10.9
W2 STPAL 81 119        .0     -1.4     -6.7    982.1      8.3
W2 STPAL 81 120        .1     -3.3     -7.6    987.1      9.7
W2 STPAL 81 121        .6     -1.3     -6.7    990.6     12.0
W2 STPAL 81 122        .2       .1     -6.6    987.7      9.7
W2 STPAL 81 123        .6       .2     -6.9    983.5      7.9
W2 STPAL 81 124        .2      3.5     -3.9    977.2     11.8
W2 STPAL 81 125        .6      4.5     -1.9    967.7     15.7
W2 STPAL 81 126       1.0     -1.3     -6.9    971.8     23.6
W2 STPAL 81 127        .7     -7.3    -12.5    978.4     16.2
W2 STPAL 81 128        .5    -10.2    -17.2    983.1     18.8
W2 STPAL 81 129        .1    -10.9    -17.6    997.2     13.0
W2 STPAL 81 130        .2     -9.2    -16.0   1000.8     11.6
W2 STPAL 81 131       1.0     -4.0    -11.8    985.4     18.3
W2 STPAL 81 2 1        .7     -8.3    -14.0    971.8     28.7
W2 STPAL 81 2 2        .3    -19.4    -26.1    981.6     23.4
W2 STPAL 81 2 3        .4    -16.8    -23.2    985.7     18.8
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W2	STPAL	81	2	4	.1	-16.5	-22.8	991.7	18.8
W2	STPAL	81	2	5	.9	-8.3	-13.6	982.2	18.8
W2	STPAL	81	2	6	.7	-5.6	-10.5	982.9	15.7
W2	STPAL	81	2	7	1.0	-6.7	-10.5	971.6	22.7
W2	STPAL	81	2	8	.7	-12.4	-18.0	978.6	14.1
W2	STPAL	81	2	9	.7	-16.1	-21.7	980.3	13.7
W2	STPAL	81	210		1.0	-18.9	-25.2	983.1	24.5
W2	STPAL	81	211		.1	-23.3	-29.7	987.0	16.2
W2	STPAL	81	212		.5	-15.1	-20.9	996.2	10.2
W2	STPAL	81	213		.5	-6.3	-11.5	999.2	13.4
W2	STPAL	81	214		.8	-1.9	-6.2	996.4	15.7
W2	STPAL	81	215		.8	6.0	.6	986.3	26.4
W2	STPAL	81	216		.6	7.4	.9	984.3	17.4
W2	STPAL	81	217		.8	8.0	2.8	981.6	15.0
W2	STPAL	81	218		.5	9.4	4.0	982.0	16.0
W2	STPAL	81	219		.6	6.3	.7	981.4	11.8
W2	STPAL	81	220		.7	5.3	.2	984.5	10.6
W2	STPAL	81	221		1.0	3.6	.5	982.7	16.0
W2	STPAL	81	222		1.0	2.4	-2.2	975.5	28.9
W2	STPAL	81	223		.7	1.7	-3.8	973.1	26.2
W2	STPAL	81	224		.1	2.4	-5.8	981.5	14.1
W2	STPAL	81	225		.1	-.1	-6.7	991.5	16.0
W2	STPAL	81	226		.6	-1.6	-6.5	995.0	20.1
W2	STPAL	81	227		1.0	.6	-2.4	982.6	18.1
W2	STPAL	81	228		1.0	-.2	-4.7	984.8	25.5
W2	STPAL	81	3	1	.7	.4	-6.3	985.2	23.2
W2	STPAL	81	3	2	.1	-5.1	-12.9	988.3	18.3
W2	STPAL	81	3	3	.6	-1.5	-7.4	980.7	18.3
W2	STPAL	81	3	4	.3	-1.3	-7.1	979.8	16.7
W2	STPAL	81	3	5	.3	-1.9	-10.1	982.9	16.2
W2	STPAL	81	3	6	.3	-4.9	-13.2	989.4	18.3
W2	STPAL	81	3	7	0.0	-2.8	-11.4	997.2	8.1
W2	STPAL	81	3	8	.4	.0	-7.9	998.3	7.4
W2	STPAL	81	3	9	.8	1.5	-6.1	996.7	13.2
W2	STPAL	81	310		.7	1.1	-5.6	995.0	12.0
W2	STPAL	81	311		.0	3.0	-5.6	993.8	16.2
W2	STPAL	81	312		.2	6.4	-5.9	984.6	22.0
W2	STPAL	81	313		.3	1.7	-8.0	988.1	20.4
W2	STPAL	81	314		.0	4.7	-7.4	984.9	22.9
W2	STPAL	81	315		.1	7.6	-4.7	978.2	27.1
W2	STPAL	81	316		.0	2.9	-7.3	985.0	16.0
W2	STPAL	81	317		.1	1.9	-10.3	980.1	25.0
W2	STPAL	81	318		.3	-1.3	-11.5	981.1	26.4
W2	STPAL	81	319		.6	.8	-9.2	982.9	25.9
W2	STPAL	81	320		.0	.8	-9.2	982.0	13.2
W2	STPAL	81	321		.6	3.2	-7.2	985.9	10.4
W2	STPAL	81	322		.2	5.9	-5.6	994.3	8.1
W2	STPAL	81	323		.6	6.7	-5.3	994.9	7.4
W2	STPAL	81	324		.2	8.3	-5.4	994.6	13.4
W2	STPAL	81	325		.6	6.7	.1	988.9	14.1
W2	STPAL	81	326		.7	5.4	-.4	987.4	15.7
W2	STPAL	81	327		.8	8.3	-.6	994.1	23.8
W2	STPAL	81	328		1.0	15.7	6.5	984.0	25.9
W2	STPAL	81	329		1.0	12.6	9.2	970.9	17.4
W2	STPAL	81	330		1.0	6.7	2.6	972.2	13.9
W2	STPAL	81	331		.9	8.7	2.3	971.9	32.2
W2	STPAL	81	4	1	.7	6.7	.4	978.7	27.3
W2	STPAL	81	4	2	.5	13.1	2.0	980.8	17.4
W2	STPAL	81	4	3	.9	10.2	4.5	968.3	24.5
W2	STPAL	81	4	4	1.0	1.5	-3.1	971.5	29.4

W2	STPAL	81	4 5	.3	2.4	-8.3	991.4	12.7
W2	STPAL	81	4 6	.1	7.1	-2.7	990.3	26.2
W2	STPAL	81	4 7	.9	11.9	2.9	983.8	11.8
W2	STPAL	81	4 8	.9	11.9	-2.8	985.7	14.1
W2	STPAL	81	4 9	.5	11.6	-1.3	989.9	20.8
W2	STPAL	81	410	.5	15.5	2.5	987.5	17.6
W2	STPAL	81	411	.9	8.7	-1.9	991.4	18.5
W2	STPAL	81	412	.7	11.6	4.9	990.8	19.7
W2	STPAL	81	413	1.0	10.4	6.5	990.2	20.6
W2	STPAL	81	414	0.0	3.8	-7.4	1005.4	24.1
W2	STPAL	81	415	.0	8.4	-6.3	1006.5	21.8
W2	STPAL	81	416	.8	10.9	3.5	990.3	20.6
W2	STPAL	81	417	.4	13.6	1.4	985.9	23.8
W2	STPAL	81	418	.5	8.3	-1.0	996.7	12.7
W2	STPAL	81	419	.8	10.4	3.8	995.3	18.8
W2	STPAL	81	420	.4	5.3	-6.3	999.9	17.6
W2	STPAL	81	421	1.0	5.6	-1.3	987.1	17.8
W2	STPAL	81	422	1.0	11.0	8.1	978.0	11.8
W2	STPAL	81	423	1.0	5.1	1.8	976.6	30.3
W2	STPAL	81	424	.7	7.8	.6	985.3	18.8
W2	STPAL	81	425	.8	9.2	1.9	985.3	10.6
W2	STPAL	81	426	.6	14.1	4.9	987.4	10.2
W2	STPAL	81	427	.8	16.5	9.6	986.5	21.8
W2	STPAL	81	428	.8	10.1	4.9	985.5	17.4
W2	STPAL	81	429	.9	9.2	5.3	982.8	10.2
W2	STPAL	81	430	.4	9.3	5.2	987.0	10.4
W2	STPAL	81	5 1	.4	9.0	-1.5	992.8	12.7
W2	STPAL	81	5 2	.4	11.6	2.3	986.3	16.4
W2	STPAL	81	5 3	1.0	14.3	11.0	978.9	18.5
W2	STPAL	81	5 4	1.0	15.1	12.4	983.8	15.5
W2	STPAL	81	5 5	.6	12.8	4.3	995.8	20.1
W2	STPAL	81	5 6	.3	11.1	-1.0	1000.2	8.8
W2	STPAL	81	5 7	.7	11.5	.9	996.2	6.3
W2	STPAL	81	5 8	.8	12.3	3.3	987.7	13.4
W2	STPAL	81	5 9	.8	8.8	2.3	991.1	20.6
W2	STPAL	81	510	.0	6.9	-5.7	995.0	21.3
W2	STPAL	81	511	.1	9.5	-6.1	993.2	16.9
W2	STPAL	81	512	.8	10.5	-4.1	992.6	14.1
W2	STPAL	81	513	.2	13.3	-.0	992.6	10.2
W2	STPAL	81	514	.1	14.4	.2	989.7	6.3
W2	STPAL	81	515	.3	16.3	1.3	989.2	6.0
W2	STPAL	81	516	.9	17.3	3.5	992.9	14.6
W2	STPAL	81	517	1.0	13.3	4.8	997.7	19.4
W2	STPAL	81	518	.1	13.1	-3.0	999.0	18.5
W2	STPAL	81	519	0.0	14.4	-1.3	997.1	7.6
W2	STPAL	81	520	0.0	17.7	-.1	995.2	8.8
W2	STPAL	81	521	.4	20.0	1.8	991.3	19.9
W2	STPAL	81	522	.8	21.0	10.4	985.3	26.9
W2	STPAL	81	523	1.0	18.9	14.2	981.6	17.4
W2	STPAL	81	524	1.0	13.5	9.7	980.6	18.3
W2	STPAL	81	525	1.0	12.6	9.2	983.2	14.4
W2	STPAL	81	526	1.0	15.3	11.6	988.8	10.2
W2	STPAL	81	527	1.0	16.6	10.5	990.6	8.8
W2	STPAL	81	528	.9	16.9	14.1	986.5	12.0
W2	STPAL	81	529	.7	19.4	12.4	985.1	17.8
W2	STPAL	81	530	.2	15.7	5.7	990.1	14.4
W2	STPAL	81	531	.5	16.3	7.4	990.5	14.6
W2	STPAL	81	6 1	.7	21.2	10.6	986.8	17.1
W2	STPAL	81	6 2	.7	18.2	14.0	983.2	12.0
W2	STPAL	81	6 3	.6	18.1	12.3	985.8	17.8

W2	STPAL	81	6 4	.4	19.5	12.2	989.5	11.8
W2	STPAL	81	6 5	.3	22.6	10.4	987.1	18.1
W2	STPAL	81	6 6	.1	21.0	6.6	987.7	14.1
W2	STPAL	81	6 7	.9	22.2	12.9	980.5	14.6
W2	STPAL	81	6 8	.8	18.3	11.7	978.2	15.5
W2	STPAL	81	6 9	.8	17.8	12.5	979.0	12.0
W2	STPAL	81	610	.1	19.0	10.4	984.5	13.9
W2	STPAL	81	611	.8	18.7	12.4	988.9	6.7
W2	STPAL	81	612	.8	20.6	17.4	989.5	10.0
W2	STPAL	81	613	1.0	23.9	20.3	982.4	12.7
W2	STPAL	81	614	.9	22.3	19.9	980.0	16.4
W2	STPAL	81	615	.9	18.5	12.2	985.2	13.7
W2	STPAL	81	616	.4	16.4	8.8	988.9	22.2
W2	STPAL	81	617	.6	20.9	10.3	987.8	22.2
W2	STPAL	81	618	.7	18.5	6.4	989.0	22.2
W2	STPAL	81	619	.8	15.6	8.5	990.0	8.1
W2	STPAL	81	620	.9	16.0	12.1	986.3	13.0
W2	STPAL	81	621	.9	15.0	13.1	983.9	7.4
W2	STPAL	81	622	.8	16.1	11.0	986.7	13.9
W2	STPAL	81	623	.7	15.7	12.6	989.2	11.3
W2	STPAL	81	624	.5	20.3	14.4	989.3	19.4
W2	STPAL	81	625	.3	18.1	12.2	996.8	13.7
W2	STPAL	81	626	.1	18.6	12.4	999.5	2.5
W2	STPAL	81	627	.8	21.3	14.3	993.4	15.3
W2	STPAL	81	628	1.0	23.1	19.2	986.3	13.9
W2	STPAL	81	629	.7	22.6	16.0	993.4	15.7
W2	STPAL	81	630	.1	20.5	12.4	999.7	9.3
W2	STPAL	81	7 1	.3	19.8	12.6	999.6	14.4
W2	STPAL	81	7 2	.5	20.2	14.2	997.4	11.8
W2	STPAL	81	7 3	.9	22.1	18.5	993.8	6.3
W2	STPAL	81	7 4	.5	23.9	17.2	992.0	6.3
W2	STPAL	81	7 5	.1	24.5	15.2	992.2	4.9
W2	STPAL	81	7 6	.0	24.7	16.3	993.4	7.6
W2	STPAL	81	7 7	.1	26.2	18.5	993.6	11.6
W2	STPAL	81	7 8	.5	25.3	19.0	992.9	21.3
W2	STPAL	81	7 9	.1	21.8	9.0	998.9	11.6
W2	STPAL	81	710	.4	22.7	12.8	997.1	7.2
W2	STPAL	81	711	.8	21.9	20.1	992.3	10.2
W2	STPAL	81	712	.9	22.3	20.6	992.7	12.2
W2	STPAL	81	713	.7	24.4	15.6	995.6	9.5
W2	STPAL	81	714	.9	19.8	15.6	990.8	16.2
W2	STPAL	81	715	1.0	18.2	15.2	990.7	16.0
W2	STPAL	81	716	.6	21.2	16.7	992.4	6.7
W2	STPAL	81	717	.3	24.2	18.1	991.3	10.2
W2	STPAL	81	718	.5	23.3	15.6	992.3	4.4
W2	STPAL	81	719	.7	24.3	17.6	990.3	5.6
W2	STPAL	81	720	.7	21.5	16.5	987.1	13.4
W2	STPAL	81	721	.9	18.5	14.2	992.4	12.7
W2	STPAL	81	722	.9	18.5	13.3	994.2	14.1
W2	STPAL	81	723	.9	19.9	16.2	993.3	14.1
W2	STPAL	81	724	.7	20.4	18.1	992.6	11.3
W2	STPAL	81	725	.7	19.4	14.4	995.0	12.5
W2	STPAL	81	726	.6	17.4	9.2	999.4	8.3
W2	STPAL	81	727	.8	15.6	9.0	1000.0	9.3
W2	STPAL	81	728	.4	16.9	11.0	997.3	9.0
W2	STPAL	81	729	.5	18.3	11.7	995.9	16.0
W2	STPAL	81	730	.9	22.5	17.2	994.1	14.5
W2	STPAL	81	731	.9	23.8	19.4	996.0	15.5
W2	STPAL	81	8 1	1.0	21.5	19.7	995.7	10.6
W2	STPAL	81	8 2	.8	22.4	19.7	991.9	8.3

W2	STPAL	81	8 3	.5	23.9	20.0	989.8	9.5
W2	STPAL	81	8 4	.6	22.9	17.3	993.7	9.7
W2	STPAL	81	8 5	.9	22.3	18.7	993.7	14.8
W2	STPAL	81	8 6	.5	21.2	16.9	989.5	15.5
W2	STPAL	81	8 7	.8	19.2	15.9	986.4	19.0
W2	STPAL	81	8 8	.5	19.4	15.5	988.2	7.6
W2	STPAL	81	8 9	.6	18.9	13.9	991.7	10.4
W2	STPAL	81	810	.2	18.2	11.4	995.2	13.0
W2	STPAL	81	811	.6	20.6	14.9	993.1	7.4
W2	STPAL	81	812	.1	23.9	17.2	992.1	12.5
W2	STPAL	81	813	.5	23.7	18.0	993.6	10.4
W2	STPAL	81	814	.8	21.1	18.8	989.7	9.0
W2	STPAL	81	815	.1	20.7	14.4	992.6	15.3
W2	STPAL	81	816	.5	16.8	9.0	997.9	15.7
W2	STPAL	81	817	.1	16.5	9.1	998.5	6.3
W2	STPAL	81	818	.3	17.2	9.7	998.0	2.8
W2	STPAL	81	819	.2	18.3	11.3	998.1	3.5
W2	STPAL	81	820	.3	18.7	11.8	997.2	4.2
W2	STPAL	81	821	.6	19.9	13.3	996.3	7.9
W2	STPAL	81	822	.8	21.4	14.8	994.1	12.5
W2	STPAL	81	823	1.0	22.7	17.5	992.3	12.0
W2	STPAL	81	824	.8	22.5	17.8	994.5	9.5
W2	STPAL	81	825	1.0	21.0	18.1	995.2	11.1
W2	STPAL	81	826	1.0	20.1	17.4	991.3	11.8
W2	STPAL	81	827	1.0	19.6	15.8	993.6	15.3
W2	STPAL	81	828	1.0	18.3	14.9	993.0	13.4
W2	STPAL	81	829	.7	19.4	15.7	989.4	3.2
W2	STPAL	81	830	.6	20.7	16.6	987.4	5.3
W2	STPAL	81	831	.9	22.6	17.5	984.0	16.4
W2	STPAL	81	9 1	.7	16.1	10.6	987.8	16.2
W2	STPAL	81	9 2	.1	16.2	10.7	989.4	10.9
W2	STPAL	81	9 3	.5	17.0	12.5	992.9	13.7
W2	STPAL	81	9 4	.3	16.3	9.4	998.2	16.4
W2	STPAL	81	9 5	.5	16.1	11.5	997.5	13.9
W2	STPAL	81	9 6	.3	19.7	14.2	995.5	18.1
W2	STPAL	81	9 7	.5	19.4	12.3	991.9	22.2
W2	STPAL	81	9 8	.1	18.0	10.3	994.6	13.7
W2	STPAL	81	9 9	.2	21.4	13.0	987.5	13.2
W2	STPAL	81	910	.1	23.1	15.6	985.2	6.0
W2	STPAL	81	911	.2	22.6	13.5	989.7	11.8
W2	STPAL	81	912	0.0	19.2	11.1	993.3	4.9
W2	STPAL	81	913	.0	21.3	12.3	988.5	10.2
W2	STPAL	81	914	.4	17.8	7.0	993.7	12.0
W2	STPAL	81	915	.6	13.5	7.2	996.0	13.4
W2	STPAL	81	916	.7	11.2	4.2	1000.8	11.1
W2	STPAL	81	917	.4	10.3	4.0	1003.9	9.0
W2	STPAL	81	918	.6	13.1	5.0	997.7	11.3
W2	STPAL	81	919	.2	15.6	5.6	987.8	10.9
W2	STPAL	81	920	.3	14.8	5.9	986.7	4.4
W2	STPAL	81	921	.8	14.6	8.5	989.2	14.1
W2	STPAL	81	922	.5	11.3	5.4	997.2	10.4
W2	STPAL	81	923	.6	10.5	5.7	997.2	12.7
W2	STPAL	81	924	.9	15.2	10.3	996.3	9.5
W2	STPAL	81	925	1.0	16.7	13.9	990.0	12.3
W2	STPAL	81	926	.7	16.1	11.0	982.3	19.4
W2	STPAL	81	927	.5	11.5	2.4	990.5	26.9
W2	STPAL	81	928	.4	9.2	2.0	996.6	9.3
W2	STPAL	81	929	.7	14.2	7.9	989.8	19.4
W2	STPAL	81	930	1.0	12.6	9.7	985.1	20.6
W2	STPAL	8110	1	.8	6.5	.4	988.0	28.2

W2	STPAL	8110 2	.0	5.0	-1.1	994.8	12.5
W2	STPAL	8110 3	.8	7.6	1.5	987.2	21.5
W2	STPAL	8110 4	1.0	10.8	7.9	982.7	13.7
W2	STPAL	8110 5	1.0	11.8	8.6	988.9	10.6
W2	STPAL	8110 6	.4	9.4	3.1	993.9	22.2
W2	STPAL	8110 7	.1	8.1	.7	996.2	8.3
W2	STPAL	8110 8	.6	10.7	.8	991.0	19.0
W2	STPAL	8110 9	.9	9.2	4.0	988.8	17.6
W2	STPAL	811010	.7	11.5	8.3	993.2	11.6
W2	STPAL	811011	.4	10.8	6.9	997.9	16.0
W2	STPAL	811012	1.0	13.5	5.8	995.0	26.4
W2	STPAL	811013	1.0	15.8	10.8	992.1	20.1
W2	STPAL	811014	.9	13.3	9.7	991.0	16.2
W2	STPAL	811015	.3	10.4	3.5	996.4	13.9
W2	STPAL	811016	.3	10.8	3.4	994.2	13.0
W2	STPAL	811017	1.0	11.7	7.9	977.4	20.8
W2	STPAL	811018	.7	5.2	-2.8	982.3	37.5
W2	STPAL	811019	.5	7.1	-1.3	985.9	18.5
W2	STPAL	811020	.6	9.2	1.5	987.4	17.6
W2	STPAL	811021	.9	3.3	-2.8	999.1	13.9
W2	STPAL	811022	.5	-.4	-6.7	996.4	19.7
W2	STPAL	811023	.7	-.2	-10.4	997.2	18.1
W2	STPAL	811024	1.0	-.6	-5.2	982.7	24.5
W2	STPAL	811025	.8	1.9	-2.8	986.4	9.3
W2	STPAL	811026	.2	2.8	-3.5	987.4	17.6
W2	STPAL	811027	.2	8.3	1.0	990.6	10.0
W2	STPAL	811028	.9	9.0	3.1	993.3	21.5
W2	STPAL	811029	.6	12.2	4.7	988.5	25.5
W2	STPAL	811030	.7	14.9	7.6	987.5	29.4
W2	STPAL	811031	.3	11.1	1.7	999.0	11.3
W2	STPAL	8111 1	.3	7.8	-.6	1001.2	3.7
W2	STPAL	8111 2	.2	8.6	.6	1000.4	4.9
W2	STPAL	8111 3	.3	10.3	4.7	997.4	7.4
W2	STPAL	8111 4	.8	12.8	9.1	991.8	9.7
W2	STPAL	8111 5	.6	9.2	3.2	988.2	22.2
W2	STPAL	8111 6	0.0	5.6	-2.4	990.9	7.9
W2	STPAL	8111 7	.2	8.7	-1.2	986.9	13.4
W2	STPAL	8111 8	.4	6.0	-5.2	993.1	25.5
W2	STPAL	8111 9	.2	-1.0	-11.2	1001.7	12.3
W2	STPAL	811110	.5	4.7	-5.1	992.1	19.7
W2	STPAL	811111	0.0	2.7	-2.4	997.5	6.9
W2	STPAL	811112	0.0	5.9	-.9	994.8	16.7
W2	STPAL	811113	.1	9.2	1.7	992.1	20.1
W2	STPAL	811114	.5	11.2	4.9	987.1	20.1
W2	STPAL	811115	.9	11.9	6.9	982.2	19.0
W2	STPAL	811116	.2	7.6	.3	983.6	12.7
W2	STPAL	811117	.4	4.8	.5	987.3	8.3
W2	STPAL	811118	1.0	3.3	-.3	983.0	18.3
W2	STPAL	811119	1.0	-.3	-2.0	985.4	22.2
W2	STPAL	811120	.7	-3.8	-7.4	987.6	16.7
W2	STPAL	811121	.3	-9.2	-10.9	986.6	7.4
W2	STPAL	811122	.6	-7.1	-9.0	983.3	13.7
W2	STPAL	811123	1.0	-1.3	-3.1	980.2	15.7
W2	STPAL	811124	1.0	-.4	-2.0	987.4	10.0
W2	STPAL	811125	1.0	1.7	-.8	979.7	20.6
W2	STPAL	811126	1.0	1.5	-1.0	974.1	17.4
W2	STPAL	811127	1.0	-.8	-5.6	987.9	28.5
W2	STPAL	811128	.9	-1.7	-5.3	994.5	10.0
W2	STPAL	811129	.7	-.7	-3.9	991.4	13.0
W2	STPAL	811130	.6	-1.2	-4.2	979.9	20.8

```
W2 STPAL 8112 1      1.0      .6     -1.9    965.5    24.3
W2 STPAL 8112 2      1.0    -2.6     -5.0    972.0    15.3
W2 STPAL 8112 3      1.0    -5.1     -7.2    977.0    17.1
W2 STPAL 8112 4       .4    -3.8     -6.3    992.0    13.4
W2 STPAL 8112 5       .7    -8.8    -10.4    990.5    11.8
W2 STPAL 8112 6      1.0      .8     -2.4    979.2    14.6
W2 STPAL 8112 7       .8     1.1     -2.2    980.6    20.8
W2 STPAL 8112 8      1.0    -1.3     -5.3    993.1    18.3
W2 STPAL 8112 9       .6    -4.5     -9.2    999.7    12.7
W2 STPAL 811210       .7    -7.5    -10.8    995.1     8.6
W2 STPAL 811211      1.0    -3.0     -7.6    992.3    12.7
W2 STPAL 811212      1.0      .1     -3.0    991.5    12.7
W2 STPAL 811213      1.0     0.0     -2.2    991.4    11.3
W2 STPAL 811214       .4   -10.8    -14.6    988.7    18.8
W2 STPAL 811215       .3   -14.2    -17.9    987.2     7.4
W2 STPAL 811216       .4   -16.5    -20.6    988.9    12.0
W2 STPAL 811217       .1   -16.4    -21.7    994.2    17.6
W2 STPAL 811218       .3   -16.5    -22.1    997.0    11.3
W2 STPAL 811219       .0   -19.8    -24.0    993.1    11.3
W2 STPAL 811220       .7    -9.1    -13.5    977.8    26.4
W2 STPAL 811221       .4    -2.8     -5.1    968.7    14.6
W2 STPAL 811222       .2    -5.8     -9.5    974.7    18.5
W2 STPAL 811223       .5    -9.9    -13.5    978.1    20.6
W2 STPAL 811224       .4    -9.3    -13.2    983.4    15.3
W2 STPAL 811225      1.0    -7.6    -10.2    983.7    11.1
W2 STPAL 811226      1.0    -4.0     -6.6    975.6    16.2
W2 STPAL 811227       .9    -5.9     -9.0    973.2    18.5
W2 STPAL 811228       .2   -14.4    -17.7    983.4    14.4
W2 STPAL 811229       .7   -17.8    -23.0    989.4     8.8
W2 STPAL 811230       .8   -11.9    -15.3    983.8    15.7
W2 STPAL 811231       .8    -7.6    -10.9    975.8    21.5
FISH HAR     8760      2
               0.     0.
               0.     0.
OUTL1          24    327
OUTL3  EG  81 13       1    .402        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 14       1    .417        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 15       1    .417        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 16       1    .407        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 17       1    .407        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 18       1    .407        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 19       1    .412        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 20       1    .412        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 21       1    .407        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 22       1    .407        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 23       1    .407        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 24       1    .417        2   0.000        3   0.000        4   0.000
WRFLO2EG      .00
OUTL3  EG  81 25       1    .417        2   0.000        3   0.000        4   0.000
```

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WRFLO2EG      .00
OUTL3   EG  81 26        1    .412      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 27        1    .412      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 28        1    .396      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 29        1    .387      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 30        1    .382      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 31        1    .392      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 32        1    .412      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 33        1    .396      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 34        1    .396      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 35        1    .392      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 36        1    .392      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 37        1    .396      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 38        1    .417      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 39        1    .412      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 40        1    .412      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 41        1    .412      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 42        1    .396      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 43        1    .387      2   0.000      3   0.000      4   0.000
WRFLO2EG      .00
OUTL3   EG  81 44        1    .387      2   0.000      3   0.000      4   0.000
WRFLO2EG      .01
OUTL3   EG  81 45        1    .398      2   0.000      3   0.000      4   0.000
WRFLO2EG      .01
OUTL3   EG  81 46        1    .398      2   0.000      3   0.000      4   0.000
WRFLO2EG      .02
OUTL3   EG  81 47        1    .398      2   0.000      3   0.000      4   0.000
WRFLO2EG      .58
OUTL3   EG  81 48        1    .398      2   0.000      3   0.000      4   0.000
WRFLO2EG     8.41
OUTL3   EG  81 49        1    .398      2   0.000      3   0.000      4   0.000
WRFLO2EG     4.94
OUTL3   EG  81 50        1    .398      2   0.000      3   0.000      4   0.000
WRFLO2EG     2.36
OUTL3   EG  81 51        1    .398      2   0.000      3   0.000      4   0.000
WRFLO2EG     1.16
OUTL3   EG  81 52        1    .398      2   0.000      3   0.000      4   0.000
WRFLO2EG      .76
OUTL3   EG  81 53        1    .398      2   0.000      3   0.000      4   0.000
WRFLO2EG     8.89
OUTL3   EG  81 54        1    .398      2   0.000      3   0.000      4   0.000
WRFLO2EG     4.36
OUTL3   EG  81 55        1    .398      2   0.000      3   0.000      4   0.000
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WRFLO2EG		1.44							
OUTL3 EG	81 56	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		1.04							
OUTL3 EG	81 57	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.68							
OUTL3 EG	81 58	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.60							
OUTL3 EG	81 59	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		6.73							
OUTL3 EG	81 60	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		2.21							
OUTL3 EG	81 61	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		1.25							
OUTL3 EG	81 62	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.82							
OUTL3 EG	81 63	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.48							
OUTL3 EG	81 64	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.37							
OUTL3 EG	81 65	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.28							
OUTL3 EG	81 66	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.23							
OUTL3 EG	81 67	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.20							
OUTL3 EG	81 68	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		1.16							
OUTL3 EG	81 69	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		2.27							
OUTL3 EG	81 70	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.93							
OUTL3 EG	81 71	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		2.69							
OUTL3 EG	81 72	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		4.36							
OUTL3 EG	81 73	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		1.30							
OUTL3 EG	81 74	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.59							
OUTL3 EG	81 75	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.57							
OUTL3 EG	81 76	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.42							
OUTL3 EG	81 77	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.25							
OUTL3 EG	81 78	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.17							
OUTL3 EG	81 79	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.14							
OUTL3 EG	81 80	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.14							
OUTL3 EG	81 81	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.11							
OUTL3 EG	81 82	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.11							
OUTL3 EG	81 83	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.08							
OUTL3 EG	81 84	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.08							
OUTL3 EG	81 85	1	.398	2	0.000	3	0.000	4	0.000

WRFLO2EG	.13								
OUTL3 EG	81 86	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.18								
OUTL3 EG	81 87	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.23								
OUTL3 EG	81 88	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.25								
OUTL3 EG	81 89	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.59								
OUTL3 EG	81 90	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.76								
OUTL3 EG	81 91	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.51								
OUTL3 EG	81 92	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.59								
OUTL3 EG	81 93	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.42								
OUTL3 EG	81 94	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	7.48								
OUTL3 EG	81 95	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	3.82								
OUTL3 EG	81 96	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.16								
OUTL3 EG	81 97	1	1.32	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.00								
OUTL3 EG	81 98	1	.878	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 99	1	.255	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.00								
OUTL3 EG	81100	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81101	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.17								
OUTL3 EG	81102	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.25								
OUTL3 EG	81103	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.25								
OUTL3 EG	81104	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.23								
OUTL3 EG	81105	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.20								
OUTL3 EG	81106	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.17								
OUTL3 EG	81107	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.17								
OUTL3 EG	81108	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.14								
OUTL3 EG	81109	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.14								
OUTL3 EG	81110	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.14								
OUTL3 EG	81111	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.14								
OUTL3 EG	81112	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.17								
OUTL3 EG	81113	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.45								
OUTL3 EG	81114	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.75								
OUTL3 EG	81115	1	.398	2	0.000	3	0.000	4	0.000

WRFLO2EG	.99								
OUTL3 EG	81116	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.57								
OUTL3 EG	81117	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.37								
OUTL3 EG	81118	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.25								
OUTL3 EG	81119	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.23								
OUTL3 EG	81120	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.25								
OUTL3 EG	81121	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.70								
OUTL3 EG	81122	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.99								
OUTL3 EG	81123	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.51								
OUTL3 EG	81124	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	5.21								
OUTL3 EG	81125	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	8.41								
OUTL3 EG	81126	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	2.35								
OUTL3 EG	81127	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.79								
OUTL3 EG	81128	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.48								
OUTL3 EG	81129	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.29								
OUTL3 EG	81130	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.24								
OUTL3 EG	81131	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.20								
OUTL3 EG	81132	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.16								
OUTL3 EG	81133	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.16								
OUTL3 EG	81134	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.16								
OUTL3 EG	81135	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.14								
OUTL3 EG	81136	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.14								
OUTL3 EG	81137	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.11								
OUTL3 EG	81138	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.11								
OUTL3 EG	81139	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.08								
OUTL3 EG	81140	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.08								
OUTL3 EG	81141	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.08								
OUTL3 EG	81142	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.08								
OUTL3 EG	81143	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.11								
OUTL3 EG	81144	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.17								
OUTL3 EG	81145	1	.398	2	0.000	3	0.000	4	0.000

WRFLO2EG		.14								
OUTL3	EG	81146	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.14								
OUTL3	EG	81147	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.14								
OUTL3	EG	81148	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.11								
OUTL3	EG	81149	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.14								
OUTL3	EG	81150	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.14								
OUTL3	EG	81151	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.08								
OUTL3	EG	81152	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.08								
OUTL3	EG	81153	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.08								
OUTL3	EG	81154	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.08								
OUTL3	EG	81155	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.08								
OUTL3	EG	81156	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.08								
OUTL3	EG	81157	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.08								
OUTL3	EG	81158	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.03								
OUTL3	EG	81159	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.05								
OUTL3	EG	81160	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.05								
OUTL3	EG	81161	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.05								
OUTL3	EG	81162	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.03								
OUTL3	EG	81163	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.14								
OUTL3	EG	81164	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.17								
OUTL3	EG	81165	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.20								
OUTL3	EG	81166	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.93								
OUTL3	EG	81167	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.59								
OUTL3	EG	81168	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.51								
OUTL3	EG	81169	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.34								
OUTL3	EG	81170	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.25								
OUTL3	EG	81171	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.28								
OUTL3	EG	81172	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.20								
OUTL3	EG	81173	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.17								
OUTL3	EG	81174	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG		.17								
OUTL3	EG	81175	1	.398	2	0.000	3	0.000	4	0.000

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WRFLO2EG      .14
OUTL3   EG  81176        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .14
OUTL3   EG  81177        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .08
OUTL3   EG  81178        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .08
OUTL3   EG  81179        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .08
OUTL3   EG  81180        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .08
OUTL3   EG  81181        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .08
OUTL3   EG  81182        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .02
OUTL3   EG  81183        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .02
OUTL3   EG  81184        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .02
OUTL3   EG  81185        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .02
OUTL3   EG  81186        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG  81187        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .04
OUTL3   EG  81188        1     .396       2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG  81189        1     .396       2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG  81190        1     .396       2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG  81191        1     .396       2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG  81192        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .02
OUTL3   EG  81193        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .08
OUTL3   EG  81194        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .02
OUTL3   EG  81195        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG  81196        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .17
OUTL3   EG  81197        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .08
OUTL3   EG  81198        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .02
OUTL3   EG  81199        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .20
OUTL3   EG  81200        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .04
OUTL3   EG  81201        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG  81202        1     .398       2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG  81203        1     .396       2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG  81204        1     .396       2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG  81205        1     .396       2    0.000        3    0.000        4    0.000
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WRFLO2EG	.00								
OUTL3 EG	81206	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81207	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81208	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81209	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81210	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81211	1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81212	1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81213	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.26								
OUTL3 EG	81214	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.17								
OUTL3 EG	81215	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.08								
OUTL3 EG	81216	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.02								
OUTL3 EG	81217	1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81218	1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81219	1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81220	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81221	1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81222	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81223	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81224	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81225	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81226	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81227	1	.398	2	0.000	3	0.000	4	0.000
WRFLO2EG	.02								
OUTL3 EG	81228	1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81229	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81230	1	.340	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81231	1	.340	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81232	1	.340	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81233	1	.340	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81234	1	.340	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81235	1	.340	2	0.000	3	0.000	4	0.000

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WRFLO2EG      .00
OUTL3  EG  81236     1   .340    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81237     1   .368    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81238     1   .396    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81239     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .37
OUTL3  EG  81240     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG     1.33
OUTL3  EG  81241     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .62
OUTL3  EG  81242     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .31
OUTL3  EG  81243     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .25
OUTL3  EG  81244     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .28
OUTL3  EG  81245     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .14
OUTL3  EG  81246     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .06
OUTL3  EG  81247     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .03
OUTL3  EG  81248     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81249     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81250     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .11
OUTL3  EG  81251     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .08
OUTL3  EG  81252     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .03
OUTL3  EG  81253     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81254     1   .398    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81255     1   .396    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81256     1   .368    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81257     1   .368    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81258     1   .368    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81259     1   .368    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81260     1   .368    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81261     1   .396    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81262     1   .396    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81263     1   .396    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81264     1   .396    2  0.000    3  0.000    4  0.000
WRFLO2EG      .00
OUTL3  EG  81265     1   .396    2  0.000    3  0.000    4  0.000
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WRFLO2EG     .00
OUTL3  EG  81266     1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG  81267     1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG  81268     1    .398     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG  81269     1    .398     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG  81270     1    .398     2   0.000     3   0.000     4   0.000
WRFLO2EG     .03
OUTL3  EG  81271     1    .398     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG  81272     1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG  81273     1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
WRFLO2EG     .00
OUTL3  EG            1    .396     2   0.000     3   0.000     4   0.000
```

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WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
WRFLO2EG      .00
OUTL3   EG                1     .396        2    0.000        3    0.000        4    0.000
```

WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81334	1	2.10	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81335	1	1.02	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG		1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81339	1	.396	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
Q1 TRIB1	24	37							
	0.25	0.23	0.23	0.21	0.23	0.24	0.25	0.23	0.23
	0.21	0.21	0.25	0.22	0.22	0.17	0.16	0.19	0.21
	0.21	0.19	0.16	0.17	0.18	0.18	0.19	0.19	0.17
	0.90	0.11	0.18	0.11	0.11	0.19	0.41	4.90	7.49
	2.62	1.04	0.70	4.91	13.92	1.67	0.49	0.80	0.69
	4.38	8.63	1.68	0.83	0.58	0.48	0.46	0.39	0.34
	0.83	2.36	1.88	2.06	4.64	2.66	0.26	0.56	0.63
	0.46	0.31	0.29	0.30	0.30	0.31	0.30	0.28	0.31
	0.39	0.44	0.45	0.80	0.95	0.86	0.90	0.72	4.36
	6.71	1.47	0.21	0.28	0.65	0.91	0.63	0.55	0.54
	0.65	0.43	0.37	0.38	0.37	0.37	0.32	0.35	0.30
	0.40	1.23	2.82	0.76	0.31	0.51	1.37	0.37	0.50
	1.26	1.33	2.53	5.27	5.63	3.86	0.33	0.62	0.49
	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.35	0.34
	0.34	0.34	0.34	0.38	0.38	0.38	0.35	0.34	0.33
	0.33	0.33	0.34	0.34	0.30	0.30	0.30	0.29	0.31
	0.31	0.27	0.27	0.27	0.27	0.27	0.30	0.32	0.45
	1.53	0.64	0.43	0.38	0.26	0.35	0.31	0.29	0.31
	0.29	0.27	0.26	0.24	0.24	0.22	0.19	0.19	0.19
	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.21
	0.23	0.17	0.23	0.24	0.19	0.22	0.21	0.22	0.17
	0.17	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.19
	0.19	0.19	0.16	0.22	0.22	0.24	0.24	0.22	0.22
	0.26	0.26	0.26	0.26	0.28	0.29	0.24	0.23	0.25
	0.25	0.25	0.25	0.25	0.25	0.28	0.25	0.25	0.25
	0.25	0.52	0.52	0.44	0.36	0.38	0.33	0.23	0.15
	0.15	0.15	0.12	0.20	0.12	0.12	0.16	0.16	0.16
	0.11	0.12	0.11	0.11	0.13	0.13	0.13	0.13	0.13
	0.13	0.12	0.11	0.11	0.13	0.13	0.11	0.11	0.12
	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22

	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
	0.22	0.22	0.22	0.22	0.16	0.16	0.16	0.16	0.16
	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	0.16	0.16	0.16	0.00	0.00	0.00	0.00	0.00	0.00
WQ1 ALG1	8760	1							
	0.	0.							
WQ1 ALG2	8760	1							
	0.	0.							
WQ1 ALG3	8760	1							
	.0	.0							
T181ALK	336	3							
	202.680	192.920	209.660	97.180	78.040	191.080	141.660	187.620	78.000
	191.800	197.680	141.980	197.740	192.920	192.920	194.220	194.040	192.920
	195.920	197.560	157.200	200.620	199.740	202.620	212.380	0.000	
T181DOC	336	3							
	1.676	2.170	1.312	9.520	17.662	1.530	5.996	1.712	11.614
	4.354	2.264	7.728	2.722	2.558	0.288	1.918	0.112	2.012
	1.476	3.820	1.382	0.694	0.912	1.782	1.782		
T181NH4	336	3							
	0.021	0.032	0.000	0.464	0.189	0.017	0.017	0.000	0.039
	0.000	0.038	0.128	0.054	0.063	0.028	0.020	0.026	0.000
	0.007	0.003	0.018	0.017	0.001	0.000	0.006		
T181NO2	336	3							
	1.993	1.944	2.108	1.348	0.661	1.570	1.348	1.150	0.583
	1.042	1.088	1.650	0.996	0.805	0.970	0.898	1.039	1.174
	1.050	1.282	0.986	1.439	1.489	1.639	1.765		
WQ1 DUMY	8760	1							
	0.	0.							
T181COLI	336	3							
	0.010	0.010	1.100	0.686	59.622	0.940	40.900	2.350	9406.560
	20.680	67.100	1991.440	161.880	190.200	108.140	52.120	65.600	106.620
	29.340	19.340	334.900	4.900	23.680	0.660	0.540		
DET T1	336	3							
DET1	2.22	2.22	0.89	1.00	1.11	2.22	2.22	0.55	2.22
DET2	2.44	1.33	2.67	2.22	0.01	1.33	1.78	3.11	2.22
DET3	1.33	3.11	2.00	1.56	1.56	2.22			
T181DO	168	6							
	12.252	13.416	12.358	12.158	12.164	12.046	11.928	14.456	12.570
	11.212	11.042	10.708	9.924	11.824	11.294	8.642	9.236	10.424
	9.290	8.608	7.674	7.592	6.814	8.348	6.958	6.876	6.412
	7.318	8.506	9.976	8.030	8.412	7.630	7.330	8.206	8.284
	9.324	9.172	9.332	9.614	10.172	11.412	11.800	12.466	11.836
	12.866	11.730	12.860	13.740	10.064	13.048			
T181P	24	37							
	0.018	0.018	0.017	0.016	0.017	0.017	0.018	0.017	0.017
	0.016	0.016	0.018	0.018	0.018	0.017	0.015	0.016	0.016
	0.017	0.016	0.015	0.017	0.018	0.018	0.018	0.018	0.017
	0.028	0.013	0.018	0.013	0.013	0.018	0.033	0.195	0.189
	0.071	0.032	0.025	0.172	0.378	0.046	0.018	0.027	0.026
	0.142	0.250	0.047	0.028	0.023	0.021	0.022	0.020	0.019
	0.037	0.067	0.050	0.057	0.111	0.066	0.012	0.020	0.024
	0.019	0.018	0.018	0.019	0.020	0.020	0.019	0.020	0.021
	0.020	0.019	0.023	0.030	0.028	0.029	0.028	0.026	0.146
	0.158	0.040	0.011	0.014	0.026	0.034	0.027	0.025	0.025
	0.028	0.018	0.020	0.021	0.021	0.021	0.019	0.020	0.018
	0.023	0.032	0.071	0.026	0.016	0.024	0.053	0.019	0.022
	0.035	0.043	0.080	0.119	0.129	0.103	0.015	0.025	0.022

	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.020	0.020
	0.020	0.020	0.020	0.019	0.019	0.019	0.021	0.021	0.021
	0.021	0.021	0.021	0.021	0.019	0.019	0.019	0.020	0.019
	0.019	0.019	0.019	0.019	0.019	0.019	0.020	0.021	0.019
	0.045	0.031	0.028	0.025	0.021	0.024	0.023	0.024	0.023
	0.024	0.023	0.022	0.023	0.021	0.021	0.018	0.018	0.018
	0.018	0.018	0.018	0.018	0.019	0.019	0.019	0.020	0.020
	0.022	0.020	0.019	0.024	0.021	0.022	0.022	0.023	0.018
	0.018	0.019	0.019	0.020	0.020	0.020	0.020	0.019	0.019
	0.019	0.019	0.019	0.027	0.023	0.023	0.023	0.022	0.023
	0.024	0.022	0.022	0.022	0.022	0.022	0.023	0.023	0.023
	0.023	0.023	0.023	0.023	0.023	0.022	0.023	0.023	0.023
	0.023	0.018	0.018	0.019	0.020	0.020	0.026	0.023	0.017
	0.017	0.018	0.018	0.023	0.019	0.019	0.018	0.018	0.018
	0.020	0.020	0.020	0.020	0.019	0.019	0.019	0.019	0.019
	0.019	0.020	0.019	0.019	0.019	0.020	0.020	0.020	0.020
	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017
	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017
	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017
	0.017	0.017	0.017	0.017	0.018	0.018	0.018	0.018	0.018
	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
T181SI	336	3							
	11.110	11.122	10.880	9.064	6.206	8.338	8.704	6.464	9.606
	4.695	8.604	11.908	13.990	13.342	11.216	10.625	11.711	10.665
	9.552	11.191	11.374	9.347	9.904	10.491	12.039		
TEMP T1	24	37							
TEMP	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
TEMP	2.36	1.20	1.20	1.78	2.36	2.94	2.94	2.94	2.94
TEMP	3.52	4.10	4.68	3.52	2.94	2.36	2.36	2.36	2.36
TEMP	1.20	1.20	1.20	0.62	1.20	1.20	1.20	0.62	0.62
TEMP	1.20	1.78	1.20	0.50	0.50	0.04	0.62	1.20	1.78
TEMP	1.78	2.94	2.36	2.36	1.78	1.78	1.78	1.20	1.20
TEMP	1.20	1.20	0.62	1.20	1.78	2.36	2.94	3.52	2.94
TEMP	3.52	3.52	4.10	4.10	4.68	4.68	5.26	5.84	6.42
TEMP	5.26	4.10	4.10	6.42	7.00	8.16	8.74	8.74	7.58
TEMP	7.58	8.74	11.06	12.22	9.32	8.74	8.74	9.90	9.90
TEMP	3.52	4.68	7.00	8.16	9.90	10.48	12.22	10.48	11.64
TEMP	11.06	9.90	10.48	9.90	11.64	11.06	12.22	11.06	8.16
TEMP	9.32	8.16	7.00	8.16	12.22	13.38	11.64	11.06	11.64
TEMP	12.80	13.38	13.38	14.54	13.38	12.80	12.22	11.64	10.48
TEMP	10.48	11.64	13.38	13.96	13.96	13.96	13.96	12.80	13.38
TEMP15	14.54	14.54	15.70	16.86	16.28	14.54	12.80	13.38	13.96
TEMP	13.38	16.28	15.12	15.12	16.86	16.28	16.86	16.02	16.02
TEMP	16.02	16.86	17.44	17.44	16.86	16.86	16.86	18.02	17.76
TEMP	17.34	17.17	17.02	17.60	15.12	15.70	13.96	15.12	13.96
TEMP	18.02	18.60	17.44	17.44	17.44	19.76	18.02	17.44	18.02
TEMP20	18.60	18.02	18.60	19.18	20.92	22.66	20.34	19.18	19.18
TEMP	19.18	18.60	18.02	16.28	16.86	18.02	19.18	18.60	20.34
TEMP	18.60	16.28	15.70	16.28	17.44	16.28	13.96	15.70	17.44
TEMP	18.02	19.76	18.60	17.44	19.18	20.34	19.76	20.34	20.34
TEMP	18.02	19.18	19.18	17.44	18.02	19.18	18.02	19.18	17.44
TEMP25	16.28	16.28	16.28	16.86	15.70	16.28	17.44	17.44	17.44
TEMP	18.02	19.18	19.76	18.02	17.44	18.02	16.28	14.54	14.54
TEMP	15.70	13.96	15.12	16.86	16.28	15.70	15.70	17.44	15.12
TEMP	15.70	16.28	14.54	13.38	12.22	11.64	11.06	11.06	12.22
TEMP	13.38	11.64	10.48	11.64	12.22	9.90	8.74	9.32	9.32
TEMP30	10.48	10.48	9.90	9,90	9.90	9.90	9.90	9.90	11.06

TEMP	12.80	11.64	10.48	11.06	9.32	8.16	8.74	8.74	7.00
TEMP	4.68	5.84	5.84	7.00	6.42	5.84	6.42	7.58	7.58
TEMP	8.16	8.16	9.90	11.06	8.74	7.58	8.16	9.32	9.32
TEMP	7.00	7.58	7.00	6.42	5.26	6.42	6.42	7.00	8.16
TEMP35	8.74	8.16	7.00	6.42	3.52	2.36	5.84	5.26	5.26
TEMP	5.26	5.84	6.42	6.42	5.84	5.84	5.26	0.50	0.50
WQ1T1TDS	336	3							
WQ2T1TDS	263.	263.	263.	250.	221.	159.	250.	212.	261.
WQ2T1TDS	132.	245.	267.	223.	262.	245.	261.	258.	281.
WQ1T1TDS	235.	276.	276.	252.	260.	261.	249.	252.	262.
T181SS	336	3							
	0.324	0.324	0.770	8.640	7.384	3.056	4.426	1.252	17.160
	3.752	1.504	22.022	7.676	7.640	5.760	6.420	2.538	4.700
	5.640	0.720	4.444	1.979	0.000	3.180	0.790		
T181PH	168	6							
	7.788	7.564	7.870	8.416	7.876	7.770	7.764	8.288	7.882
	7.794	8.258	7.806	8.000	8.282	9.322	8.276	7.806	8.476
	8.294	8.300	8.412	8.506	8.306	8.494	8.388	8.094	8.070
	8.094	7.700	8.200	8.394	8.288	8.294	8.188	8.394	8.394
	8.388	8.494	8.412	8.224	8.506	8.694	8.700	8.694	8.694
	8.800	8.494	8.442	8.500	8.588	8.206			
ANATRIB1	336	25							
TRIB1	0.00	0.00	0.00	0.00	.0	9.88	.0		
TRIB1	0.00	0.00	0.15	0.00	.0	9.12	.0		
TRIB1	0.00	0.00	0.20	0.00	.0	9.75	.0		
TRIB1	0.00	0.00	0.39	0.00	.0	17.53	.0		
TRIB1	0.00	0.00	0.11	0.00	.0	8.50	.0		
TRIB1	0.01	0.00	0.38	0.00	.0	8.60	.0		
TRIB1	0.00	0.00	0.68	0.00	.0	10.54	.0		
TRIB1	0.00	0.00	0.23	0.00	.0	8.44	.0		
TRIB1	0.09	0.00	0.28	0.00	.0	8.87	.0		
TRIB1	0.09	0.00	0.09	0.00	.0	10.60	.0		
TRIB1	0.00	0.00	0.00	0.00	.0	9.57	.0		
TRIB1	0.00	0.00	0.48	0.00	.0	9.62	.0		
TRIB1	0.00	0.00	0.10	0.00	.0	9.42	.0		
TRIB1	0.00	0.00	0.20	0.00	.0	8.75	.0		
TRIB1	0.00	0.00	0.00	0.00	.0	9.35	.0		
TRIB1	0.00	0.00	0.09	0.00	.0	8.34	.0		
TRIB1	0.00	0.00	0.31	0.00	.0	8.45	.0		
TRIB1	0.00	0.00	0.66	0.00	.0	2.92	.0		
TRIB1	0.48	0.00	0.28	0.00	.0	6.16	.0		
TRIB1	0.09	0.00	0.00	0.00	.0	5.55	.0		
TRIB1	0.00	0.00	0.05	0.00	.0	1.12	.0		
TRIB1	0.01	0.00	0.01	0.00	.0	9.55	.0		
TRIB1	0.00	0.00	0.19	0.00	.0	8.43	.0		
TRIB1	0.00	0.00	0.10	0.00	.0	8.87	.0		
TRIB1	0.00	0.00	0.00	0.00	.0	8.37	.0		
Q1 TRIB2	24	37							
	0.19	0.21	0.17	0.16	0.18	0.18	0.19	0.18	0.18
	0.16	0.17	0.19	0.22	0.22	0.20	0.16	0.16	0.17
	0.19	0.16	0.16	0.20	0.22	0.22	0.23	0.23	0.20
	0.11	0.12	0.22	0.12	0.12	0.22	0.52	2.72	0.86
	0.33	0.15	0.15	2.00	2.61	0.17	0.08	0.16	0.19
	1.43	2.05	0.19	0.15	0.16	0.16	0.19	0.18	0.18
	0.44	0.39	0.16	0.28	0.26	0.17	0.04	0.09	0.15
	0.13	0.17	0.18	0.20	0.22	0.23	0.21	0.23	0.24
	0.18	0.12	0.23	0.23	0.08	0.17	0.12	0.16	1.56
	0.39	0.13	0.04	0.08	0.20	0.29	0.25	0.24	0.25
	0.26	0.11	0.19	0.21	0.22	0.22	0.19	0.21	0.18
	0.25	0.04	0.21	0.15	0.11	0.23	0.58	0.17	0.18

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            0.10      0.31      0.67      0.11      0.17      0.53      0.09      0.20      0.19
            0.17      0.17      0.17      0.18      0.18      0.18      0.18      0.19      0.20
            0.20      0.20      0.20      0.16      0.16      0.16      0.22      0.23      0.24
            0.24      0.24      0.23      0.23      0.21      0.21      0.21      0.22      0.20
            0.20      0.21      0.21      0.21      0.21      0.21      0.24      0.24      0.12
            0.24      0.35      0.38      0.33      0.26      0.30      0.31      0.33      0.31
            0.33      0.32      0.30      0.32      0.28      0.29      0.23      0.23      0.23
            0.23      0.23      0.23      0.23      0.24      0.24      0.24      0.26      0.27
            0.31      0.28      0.22      0.35      0.30      0.32      0.33      0.35      0.23
            0.23      0.25      0.25      0.28      0.28      0.28      0.28      0.27      0.24
            0.24      0.24      0.25      0.45      0.35      0.33      0.33      0.31      0.35
            0.35      0.31      0.31      0.31      0.29      0.28      0.33      0.34      0.32
            0.32      0.32      0.32      0.32      0.32      0.29      0.32      0.32      0.32
            0.32      0.05      0.05      0.13      0.21      0.19      0.38      0.33      0.21
            0.21      0.23      0.25      0.36      0.27      0.27      0.24      0.24      0.24
            0.29      0.28      0.29      0.29      0.27      0.27      0.27      0.27      0.27
            0.27      0.28      0.28      0.28      0.27      0.29      0.29      0.29      0.28
            0.17      0.17      0.17      0.17      0.17      0.17      0.17      0.17      0.17
            0.17      0.17      0.17      0.17      0.17      0.17      0.17      0.17      0.17
            0.17      0.17      0.17      0.17      0.17      0.17      0.17      0.17      0.17
            0.17      0.17      0.17      0.17      0.23      0.23      0.23      0.23      0.23
            0.23      0.23      0.23      0.23      0.23      0.23      0.23      0.23      0.23
            0.23      0.23      0.23      0.23      0.23      0.23      0.23      0.23      0.23
            0.23      0.23      0.23      0.23      0.23      0.23      0.23      0.23      0.23
            0.23      0.23      0.23      0.00      0.00      0.00      0.00      0.00      0.00
WQ1 ALG1    8760         1
              0.        0.
WQ1 ALG2    8760         1
              0.        0.
WQ1 ALG3    8760         1
              0.        0.
T281ALK      336         3
         176.960   176.800   177.880   160.560   148.560   177.680   177.440   180.520   158.040
         180.640   179.080   180.400   183.440   178.080   183.400   188.160   183.560   187.080
         183.560   183.920   182.560   181.920   180.440   180.280   180.480     0.000
T281DOC      336         3
           1.416     2.336     1.576     2.880     4.168     1.044     1.064     0.612     3.368
           2.976     0.440     0.464     1.056     1.084     0.244     1.328     1.056     1.528
           1.436     0.704     1.044     0.564     0.532     0.848     0.868
T281NH4      336         3
           0.010     0.001     0.002     0.016     0.022     0.003     0.000     0.045     0.017
           0.011     0.003     0.007     0.030     0.024     0.007     0.012     0.001     0.000
           0.000     0.006     0.016     0.024     0.016     0.000     0.008
T281NO2      336         3
           1.768     1.814     1.745     1.536     1.481     1.671     1.761     1.616     1.387
           1.628     1.482     1.575     1.432     1.466     1.460     1.501     0.503     1.652
           1.473     1.643     1.664     1.871     1.794     1.758     1.768
WQ1 DUMY    8760         1
              0.        0.
T281COLI     336         3
           0.187     0.187     0.263     8.380     4.400     0.840     8.840     7.760    75.040
          50.560   166.040   139.280   120.2242028.200   170.600   223.000    86.640    85.760
          50.000    71.600    28.320    13.920     9.920     4.160     3.240
DET T2       336         3
DET1        2.22      2.22      0.67      1.56      2.44      2.22      2.22      1.56      1.56
DET2        7.11      3.33      0.67      1.56      0.89      0.89      0.44      2.22      2.22
DET3        0.22      2.00      4.22      0.89      2.00      0.89
T281DO       168         6
          13.272    13.892    12.492    14.416    13.304    11.920    10.536    13.000    11.484
          11.480    11.916    11.352    10.700    11.696    11.432    10.344    10.192    10.036
```

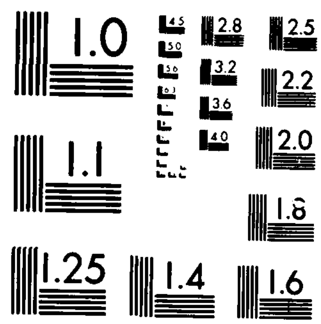
AD-A164 226 CONFIRMATION OF THE WATER QUALITY MODEL CE-QUAL-R1 USING DATA FROM EAU GA..(U) ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS ENVIR.. 2/2

UNCLASSIFIED J H WLOSINSKI ET AL. OCT 85 WES/MP/E-85-11 F/G 13/2 NL

END

FILMED

DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

	11.020	10.028	9.928	9.588	8.960	10.140	9.436	10.052	8.016
	9.540	9.760	9.800	9.612	10.100	9.544	9.148	9.528	9.788
	10.280	9.892	10.212	10.152	10.416	11.560	10.960	11.760	11.660
	12.780	11.956	9.272	13.156	10.340	13.716			
T281P	24	37							
	0.010	0.010	0.010	0.009	0.010	0.010	0.010	0.010	0.010
	0.009	0.009	0.010	0.011	0.011	0.010	0.009	0.009	0.009
	0.010	0.009	0.009	0.010	0.010	0.010	0.011	0.011	0.010
	0.016	0.007	0.010	0.007	0.007	0.010	0.019	0.111	0.108
	0.040	0.018	0.014	0.098	0.216	0.026	0.010	0.016	0.015
	0.081	0.143	0.027	0.016	0.013	0.012	0.012	0.011	0.011
	0.021	0.038	0.028	0.033	0.063	0.038	0.007	0.011	0.013
	0.011	0.010	0.010	0.011	0.011	0.012	0.011	0.011	0.012
	0.011	0.011	0.013	0.017	0.016	0.017	0.016	0.015	0.083
	0.090	0.023	0.006	0.008	0.015	0.019	0.015	0.014	0.014
	0.016	0.010	0.011	0.012	0.012	0.012	0.011	0.012	0.010
	0.013	0.018	0.041	0.015	0.009	0.014	0.030	0.011	0.013
	0.020	0.025	0.045	0.068	0.074	0.059	0.009	0.014	0.013
	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
	0.011	0.011	0.011	0.011	0.011	0.011	0.012	0.012	0.012
	0.012	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.011
	0.011	0.011	0.011	0.011	0.011	0.011	0.012	0.012	0.011
	0.026	0.018	0.016	0.014	0.012	0.013	0.013	0.014	0.013
	0.014	0.013	0.013	0.013	0.012	0.012	0.011	0.011	0.011
	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.012
	0.013	0.011	0.011	0.014	0.012	0.013	0.013	0.013	0.010
	0.010	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
	0.011	0.011	0.011	0.016	0.013	0.013	0.013	0.012	0.013
	0.014	0.013	0.013	0.013	0.013	0.012	0.013	0.013	0.013
	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
	0.013	0.010	0.010	0.011	0.012	0.011	0.015	0.013	0.010
	0.010	0.010	0.010	0.013	0.011	0.011	0.011	0.011	0.011
	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.010	0.010
	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
T281SI	336	3							
	13.260	12.616	11.432	11.804	10.816	12.205	12.775	12.368	12.577
	12.592	12.991	13.118	14.788	14.078	12.791	13.182	14.422	13.860
	13.520	13.950	13.635	13.302	13.631	13.145	13.221		
TEMP T2	24	37							
TEMP	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38
TEMP	4.77	3.90	3.90	4.34	4.77	5.21	5.21	5.21	5.21
TEMP	5.64	6.08	6.51	5.64	5.21	4.77	4.77	4.77	4.77
TEMP	3.90	3.90	3.90	3.46	3.90	3.90	3.90	3.46	3.46
TEMP	3.90	4.34	3.90	3.38	3.38	3.03	3.46	3.90	4.34
TEMP	4.34	5.21	4.77	4.77	4.34	4.34	4.34	3.90	3.90
TEMP	3.90	3.90	3.46	3.90	4.34	4.77	5.21	5.64	5.21
TEMP	5.64	5.64	6.08	6.08	6.51	6.51	6.95	7.38	7.82
TEMP	6.95	6.08	6.08	7.82	8.25	9.12	9.56	9.56	8.69
TEMP	8.69	9.56	11.30	12.16	9.99	9.56	9.56	10.43	10.43
TEMP	5.64	6.51	8.25	9.12	10.43	10.86	12.16	10.86	11.73
TEMP	11.30	10.43	10.86	10.43	11.73	11.30	12.16	11.30	9.12
TEMP	9.99	9.12	8.25	9.12	12.16	13.03	11.73	11.30	11.73

TEMP	12.60	13.03	13.03	13.90	13.03	12.60	12.16	11.73	10.86
TEMP	10.86	11.73	13.03	13.47	13.47	13.47	13.47	12.60	13.03
TEMP15	13.90	13.90	14.77	15.65	15.21	13.90	12.60	13.03	13.47
TEMP	13.03	15.21	14.34	14.34	15.65	15.21	15.65	16.52	16.52
TEMP	16.52	15.65	16.08	16.08	15.65	15.65	15.65	16.52	17.82
TEMP	18.26	17.39	16.52	16.95	14.34	14.77	13.47	14.34	13.47
TEMP	16.52	16.95	16.08	16.08	16.08	17.82	16.52	16.08	16.52
TEMP20	16.95	16.52	16.95	17.39	18.69	20.00	18.26	17.39	17.39
TEMP	17.39	16.95	16.52	15.21	15.65	16.52	17.39	16.95	18.26
TEMP	16.95	15.21	14.77	15.21	16.08	15.21	13.47	14.77	16.08
TEMP	16.52	17.82	16.95	16.08	17.39	18.26	17.82	18.26	18.26
TEMP	16.52	17.39	17.39	16.08	16.52	17.39	16.52	17.39	16.08
TEMP25	15.21	15.21	15.21	15.65	14.77	15.21	16.08	16.08	16.08
TEMP	16.52	17.39	17.82	16.52	16.08	16.52	15.21	13.90	13.90
TEMP	14.77	13.47	14.34	15.65	15.21	14.77	14.77	16.08	14.34
TEMP	14.77	15.21	13.90	13.03	12.16	11.73	11.30	11.30	12.16
TEMP	13.03	11.73	10.86	11.73	12.16	10.43	9.56	9.99	9.99
TEMP30	10.86	10.86	10.43	10.43	10.43	10.43	10.43	10.43	11.30
TEMP	12.60	11.73	10.86	11.30	9.99	9.12	9.56	9.56	8.25
TEMP	6.51	7.38	7.38	8.25	7.82	7.38	7.82	8.69	8.69
TEMP	9.12	9.12	10.43	11.30	9.56	8.69	9.12	9.99	9.99
TEMP	8.25	8.69	8.25	7.82	6.95	7.82	7.82	8.25	9.12
TEMP35	9.56	9.12	8.25	7.82	5.64	4.77	7.38	6.95	6.95
TEMP	6.95	7.38	7.82	7.82	7.38	7.38	6.95	3.38	3.38
WQ1T2TDS	336	3							
WQ2T2TDS	184.	184.	223.	212.	224.	187.	221.	222.	233.
WQ2T2TDS	193.	225.	231.	229.	227.	219.	234.	241.	253.
WQ2T2TDS	196.	243.	243.	240.	229.	248.	247.	246.	236.
T281SS	336	3							
	0.160	0.160	0.048	2.160	1.300	0.864	0.640	1.688	2.224
	4.948	0.368	2.580	3.144	5.808	2.468	2.824	1.508	9.200
	4.640	0.208	2.824	3.188	2.448	2.100	2.563		
T281PH	168	6							
	8.216	7.796	7.932	8.484	8.116	7.948	7.780	8.200	7.900
	7.848	8.048	8.048	7.784	8.068	8.236	8.136	7.968	8.152
	8.168	8.152	8.356	8.520	8.304	8.452	8.268	8.364	8.020
	7.884	8.052	8.152	8.236	8.136	8.204	8.172	8.188	8.204
	8.020	8.188	8.284	8.352	8.436	8.452	8.436	8.452	8.520
	8.556	8.356	7.916	8.636	8.536	8.216			
ANATRIB2	336	25							
TRIB2	0.00	0.00	0.00	0.00	.0	6.96	.0		
TRIB2	0.00	0.00	0.03	0.00	.0	6.96	.0		
TRIB2	0.00	0.00	0.18	0.00	.0	6.68	.0		
TRIB2	0.00	0.00	0.22	0.00	.0	8.53	.0		
TRIB2	0.03	0.00	0.33	0.00	.0	6.34	.0		
TRIB2	0.08	0.00	0.20	0.00	.0	5.91	.0		
TRIB2	0.00	0.00	0.50	0.00	.0	6.80	.0		
TRIB2	0.00	0.00	0.05	0.00	.0	5.75	.0		
TRIB2	0.00	0.00	0.00	0.00	.0	6.44	.0		
TRIB2	0.00	0.00	0.27	0.00	.0	7.31	.0		
TRIB2	0.00	0.00	0.00	0.00	.0	6.83	.0		
TRIB2	0.00	0.00	0.03	0.00	.0	6.90	.0		
TRIB2	0.00	0.00	0.10	0.00	.0	6.58	.0		
TRIB2	0.02	0.00	0.18	0.00	.0	6.21	.0		
TRIB2	0.00	0.00	0.05	0.00	.0	6.91	.0		
TRIB2	0.00	0.00	0.08	0.00	.0	5.92	.0		
TRIB2	0.00	0.00	0.62	0.00	.0	5.46	.0		
TRIB2	0.00	0.00	0.10	0.00	.0	3.92	.0		
TRIB2	0.00	0.00	0.03	0.00	.0	4.17	.0		
TRIB2	0.02	0.00	0.00	0.00	.0	4.09	.0		

TRIB2	0.00	0.00	0.00	0.00	.0	3.07	.0
TRIB2	0.12	0.00	0.10	0.00	.0	6.61	.0
TRIB2	0.00	0.00	0.12	0.00	.0	5.39	.0
TRIB2	0.00	0.00	0.10	0.00	.0	6.16	.0
TRIB2	0.00	0.00	0.00	0.00	.0	5.59	.0

DIAGNOSE99999

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TITLE                  EAU GALLE 1982
TITLE     ST PAUL MET.SOME WIND FROM EAU CLAIRE WIS.
TITLE      WEIR OUTFLOW. BURM AT 6.1M FOR INFLOW AND OUTFLOW.
TITLE      NEW IN +OUTFLOW CALC.+DEPTH AREA RELATHIONSHIP
TITLE     WLOSINSKI MAY16 84 #1    FINAL VERIFICATION RUN
JOB             12       328        24      9999       110        82         3         1
OUTPUT   COMPLETE
PHYS1            1         2        11      44.8      92.3       2.0         0   1.2-09
PHYS2          850        .4       1.2
PHYS2+         .90       .90       .90      1.00      1.00       1.0       1.0       1.0       1.0
               1.0       1.0
STRUCT    PORT+WEIR
CHOICE   SPECIFIED
PHYS3          4.1      1.08      1.08
WEIR           7.6      9.75       3.2
PHYS4        5791.    1.9543
PHYS5        251.8     .2528
MIXING        .007      .004    .00009   .000200       2.0
LIGHT          .80       .45       .10
DIFC2     5.40-10   7.50-09
ALG1           .38       .40      .004       .34
ALG2           .99      0.05      .020       .06      0.10       85.       .05       .07      .140
ALG3          1.40      0.10      .020       .09       0.1      115.      .040      .060       .17
ALG3A         1.60      0.12      .004       .07       .08       45.       .04       .01      .145
ALG3++         .05
ALG4            7.        15        28        35       0.1       0.1
ALG5            12       19.       25.       35.       0.1       0.1
ALG5+            0         8        12       17.       0.1       0.1
PLANT1         .42      .050      .012      .030        .2        .4        .4       1.5
PLANT2         .04       .10       .01      .005       40.       95.       .55       1.8
PLANT3          7.       21.       24.       34.        .2        .2
ZOO1           .99      .011      .650       .15       .25       .30       .30      0.20       .20
ZOO2           .50       2.0        12        26        36       0.1       0.1
DET1           .15       4.0        22      0.01
FISH1        .0180        .2       .03       .15       .15       .15       .37       .15
FISH2           1.      24.4      28.4      35.2        .1        .1        .8       .01       .01
DECAY1       0.040      0.01     0.020       1.4     .0012     .0010      .050        .3       .07
DECAY2          4.        22       .12
DECAY3          2.       32.       0.1
DECAY4          2.       32.       0.1
SSETL          .05       30.       40.     .0025      .005
TMP           1.04
CHEM          4.57      1.14       1.4       1.1       1.4       1.4      0.15      0.14       2.0
ANAER1          .5       5.0
ANAER2        0.14      0.16         0         5        35        40       0.1       0.1
ANAER3        0.35         0         5        35        40       0.1       0.1
ANAER4         .60         0         5        35        40       0.1       0.1
ANAER5        0.04      0.02         0         5        35        40       0.1       0.1
ANAER6         .45         0         5        35        40       0.1       0.1
ANAER7         .60      0.05         0         5        35        40       0.1       0.1
ANAER8        0.40         0         5        35        40       0.1       0.1
ANAER9        0.50       0.6         0         5        35        40       0.1       0.1
ANAER10      0.040         0         5        35        40       0.1       0.1
ANAER11        .01         0         5        35        40       0.1       0.1
ANAER12       0.50      0.05         0         5        35        40       0.1       0.1
ANAER13      0.014         0         5        35        40       0.1       0.1
ANAER14       0.40         0         5        35        40       0.1       0.1
INIT0           11
INIT1          55.
       2       0.0        0.        0.       82.                .192     1.156        0.      111.
```

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   3      2.4    15.8    10.3    .082   5001.    6.9    133.      .1     7.8
   4     13.3     0.      0.      .5      0.     0.     11.4     0.    220.
   5     1310.    0.      1.6    102.   1210.    .33    7.64
   2      1.3     0.      0.     82.             .192   1.156    0.    111.
   3      2.4    15.8    10.3    .082   5001.    6.9    133.      .1     7.8
   4     13.3     0.      0.      .5      0.     0.     11.4     0.    220.
   5     1310.    0.      1.6    102.   1210.    .33    7.64
   2      2.1     0.      0.     81.             .200   1.155    0.    111.
   3      2.4    17.6    10.4    .081   5001.    7.0    140.      .1     7.8
   4     12.0     0.      0.      .5      0.     0.     11.1     0.    220.
   5     1310.    0.      1.6    102.   1210.    .36    7.63
   2      3.1     0.      0.     81.             .185   1.158    0.    111.
   3      2.4    17.1    10.4    .083   5001.    7.0    142.      .1     7.8
   4     12.1     0.      0.      .5      0.     0.     11.8     0.    220.
   5     1310.    0.      1.6    102.   1210.    .36    7.66
   2      4.1     0.      0.     82.             .191   1.156    0.    111.
   3      2.4    16.4    10.4    .083   5001.    7.1    146.      .1     7.8
   4     12.0     0.      0.      .5      0.     0.     11.1     0.    220.
   5     1310.    0.      1.6    102.   1210.    .35    7.61
   2      5.1     0.      0.     80.             .191   1.141    0.    111.
   3      2.4    17.3    10.4    .083   5001.    7.1    153.      .1     7.8
   4     12.6     0.      0.      .5      0.     0.     12.4     0.    220.
   5     1310.    0.      1.6    102.   1210.    .35    7.59
   2      6.1     0.      0.     81.             .184   1.143    0.    111.
   3      2.4    15.1    10.4    .084    501.    7.1    147.      .1     7.8
   4     12.0     0.      0.      .5      0.     0.     12.5     0.    220.
   5     1310.    0.      1.6    102.   1210.    .36    7.48
   2      7.1     0.      0.     81.             .187   1.167    0.    111.
   3      2.4    15.3    10.4    .084    501.    7.1    143.      .1     7.8
   4     11.3     0.      0.      .5      0.     0.     11.9     0.    220.
   5     1310.    0.      1.6    102.   1210.    .36    7.62
   2      8.1     0.      0.     80.             .189   1.169    0.    111.
   3      2.4    15.8    10.4    .082    501.    7.1    147.      .1     7.8
   4     11.3     0.      0.      .5      0.     0.     12.4     0.    220.
   5     1310.    0.      1.6    102.   1210.    .37    7.63
   2      9.1     0.      0.     82.             .196   1.160    0.    111.
   3      2.4    16.2    10.4    .082    501.    7.1    144.      .1     7.8
   4     12.6     0.      0.      .5      0.     0.     12.9     0.    220.
   5     1310.    0.      1.6    102.   1210.    .38    7.61
   2     10.1     0.      0.     82.             .187   1.174    0.    111.
   3      2.4    18.0    10.3    .081    501.    7.1    146.      .1     7.8
   4     12.0     0.      0.      .5      0.     0.     11.9     0.    220.
   5     1310.    0.      1.6    102.   1210.    .38    7.63
PLANTS    8.      8.      8.
FILES   PLTWC   EG812   EG813   EG814   FLUX
ID    EAU GALLE 1982 MAY 16 84 #1 24HR.T.S.
MET          24     354
W2 STPL  82 112      0.9   -14.9   -20.0   986.8    6.6
W2 STPL  82 113      1.0   -16.4   -19.2   980.8   11.7
W2 STPL  82 114      0.3   -23.2   -26.6   972.6   10.4
W2 STPL  82 115      1.0   -16.2   -20.3   973.9   27.1
W2 STPL  82 116      0.1   -23.6   -31.7   987.1   25.7
W2 STPL  82 117      0.8   -19.3   -22.4   975.8   17.6
W2 STPL  82 118      0.9   -12.3   -15.5   979.1   13.3
W2 STPL  82 119      0.6    -9.1   -13.1   985.0   18.3
W2 STPL  82 120      0.9   -13.5   -16.7   991.9   20.8
W2 STPL  82 121      0.9    -9.3   -12.3   996.2   15.9
W2 STPL  82 122      1.0    -9.0   -11.5   980.9   30.1
W2 STPL  82 123      0.8   -13.4   -16.8   966.9   32.6
W2 STPL  82 124      0.6   -22.8   -28.3   979.5   16.3
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W2	STPL	82	125	0.4	-20.0	-27.1	986.6	12.4
W2	STPL	82	126	0.5	-18.9	-23.8	983.9	19.9
W2	STPL	82	127	0.8	-2.3	-6.4	970.7	21.6
W2	STPL	82	128	0.4	-14.1	-18.7	988.7	20.7
W2	STPL	82	129	0.8	-6.8	-11.0	987.0	13.3
W2	STPL	82	130	0.4	-12.2	-15.6	989.5	19.9
W2	STPL	82	131	0.0	-18.4	-19.7	989.8	10.5
W2	STPL	82	2 1	0.6	-16.3	-19.5	989.6	11.4
W2	STPL	82	2 2	0.7	-12.0	-15.6	992.7	16.7
W2	STPL	82	2 3	0.1	-22.4	-31.4	996.1	18.6
W2	STPL	82	2 4	0.9	-22.3	-28.6	997.8	9.9
W2	STPL	82	2 5	0.5	-21.6	-24.0	994.3	13.3
W2	STPL	82	2 6	0.2	-19.7	-24.0	985.0	18.4
W2	STPL	82	2 7	0.4	-8.5	-13.8	985.1	25.9
W2	STPL	82	2 8	0.2	-16.0	-21.0	989.3	17.7
W2	STPL	82	2 9	0.1	-20.6	-24.1	986.6	19.0
W2	STPL	82	210	0.2	-19.0	-22.6	981.8	13.3
W2	STPL	82	211	0.2	-12.7	-17.2	988.1	14.5
W2	STPL	82	212	0.9	-13.1	-16.6	994.8	5.9
W2	STPL	82	213	1.0	-7.6	-10.9	987.6	9.5
W2	STPL	82	214	0.9	-3.8	-6.7	973.6	19.8
W2	STPL	82	215	0.7	-3.3	-4.8	979.9	8.1
W2	STPL	82	216	0.6	0.1	-4.9	987.8	17.7
W2	STPL	82	217	0.9	-1.8	-6.0	984.7	16.0
W2	STPL	82	218	1.0	0.9	-1.2	986.1	11.9
W2	STPL	82	219	1.0	1.1	-1.2	983.4	15.0
W2	STPL	82	220	0.1	2.8	-2.3	979.9	16.8
W2	STPL	82	221	0.2	0.0	-4.0	986.5	12.0
W2	STPL	82	222	0.2	1.3	-2.3	983.4	15.7
W2	STPL	82	223	0.8	-2.7	-9.3	990.9	26.5
W2	STPL	82	224	0.8	-4.9	-9.1	995.7	17.7
W2	STPL	82	225	0.2	-8.5	-12.1	1006.1	10.3
W2	STPL	82	226	0.5	-4.7	-8.6	1000.7	15.0
W2	STPL	82	227	0.6	-2.9	-7.2	997.5	14.4
W2	STPL	82	228	0.6	0.0	-5.5	993.4	22.3
W2	STPL	82	3 1	0.9	-4.6	-10.8	990.8	16.3
W2	STPL	82	3 2	0.9	-6.8	-13.7	989.1	23.1
W2	STPL	82	3 3	0.8	-9.3	-16.3	989.2	17.9
W2	STPL	82	3 4	0.8	-5.8	-12.2	982.4	18.2
W2	STPL	82	3 5	0.0	-9.0	-14.3	988.5	17.0
W2	STPL	82	3 6	0.3	-8.5	-14.4	984.5	23.4
W2	STPL	82	3 7	0.2	-14.0	-19.7	989.4	13.0
W2	STPL	82	3 8	0.7	-9.5	-13.8	984.7	28.9
W2	STPL	82	3 9	0.8	-11.9	-16.9	990.8	18.7
W2	STPL	82	310	0.5	-2.1	-6.1	976.9	15.8
W2	STPL	82	311	0.5	-0.9	-5.4	984.2	16.1
W2	STPL	82	312	0.9	1.6	-1.6	969.3	26.8
W2	STPL	82	313	0.1	3.2	-6.1	977.8	38.1
W2	STPL	82	314	0.6	1.6	-5.1	990.8	13.2
W2	STPL	82	315	0.9	2.0	-3.1	983.3	21.3
W2	STPL	82	316	1.0	1.8	-1.0	977.4	14.8
W2	STPL	82	317	0.8	1.8	-1.6	987.6	9.0
W2	STPL	82	318	1.0	2.9	-0.4	993.6	10.9
W2	STPL	82	319	1.0	1.7	-2.0	987.4	28.7
W2	STPL	82	320	1.0	0.8	-1.7	977.5	19.6
W2	STPL	82	321	0.6	0.9	-4.4	984.0	18.1
W2	STPL	82	322	0.6	0.2	-4.2	988.8	13.3
W2	STPL	82	323	0.5	2.0	-2.2	977.1	16.6
W2	STPL	82	324	0.6	2.2	-3.8	980.5	23.1
W2	STPL	82	325	0.2	-2.7	-9.4	989.6	23.2

W2	STPL	82	326	0.0	-4.0	-11.7	996.2	15.7
W2	STPL	82	327	0.0	-3.5	-11.3	1000.8	15.8
W2	STPL	82	328	0.7	3.7	-3.4	994.2	24.0
W2	STPL	82	329	1.0	6.8	-0.6	984.6	27.9
W2	STPL	82	330	1.0	8.2	4.0	963.1	39.5
W2	STPL	82	331	0.5	6.5	-1.7	980.8	32.3
W2	STPL	82	4 1	0.8	4.3	-5.3	989.5	20.6
W2	STPL	82	4 2	1.0	10.4	3.3	967.1	28.5
W2	STPL	82	4 3	0.9	-4.4	-8.2	965.9	49.2
W2	STPL	82	4 4	0.7	-5.3	-14.2	989.1	19.1
W2	STPL	82	4 5	0.8	-3.5	-11.5	990.2	24.0
W2	STPL	82	4 6	0.1	-3.9	-13.9	994.5	11.3
W2	STPL	82	4 7	0.9	-2.1	-9.9	993.9	14.0
W2	STPL	82	4 8	1.0	-1.8	-5.0	987.3	9.0
W2	STPL	82	4 9	0.8	-0.7	-4.2	982.6	16.9
W2	STPL	82	410	0.9	1.2	-4.4	983.6	23.8
W2	STPL	82	411	0.3	2.5	-3.8	984.5	15.3
W2	STPL	82	412	1.0	6.2	2.0	971.2	24.3
W2	STPL	82	413	0.4	8.8	1.2	985.4	14.6
W2	STPL	82	414	0.8	11.0	4.6	985.9	23.9
W2	STPL	82	415	0.8	13.7	8.7	978.7	22.8
W2	STPL	82	416	1.0	11.9	8.6	980.5	21.5
W2	STPL	82	417	0.3	8.8	-1.2	989.4	26.2
W2	STPL	82	418	0.7	11.2	1.2	986.9	24.3
W2	STPL	82	419	1.0	4.4	0.6	983.8	25.3
W2	STPL	82	420	0.4	2.3	-7.0	991.1	18.3
W2	STPL	82	421	0.4	6.6	-5.0	999.8	12.2
W2	STPL	82	422	0.0	9.4	-1.1	1002.9	14.8
W2	STPL	82	423	0.0	15.4	0.0	994.3	22.3
W2	STPL	82	424	0.0	18.0	3.0	987.2	21.8
W2	STPL	82	425	0.9	16.0	5.3	985.0	14.9
W2	STPL	82	426	0.5	10.9	-2.0	994.2	13.8
W2	STPL	82	427	0.0	10.9	-4.5	1001.3	3.7
W2	STPL	82	428	0.4	11.3	-3.5	1000.8	10.7
W2	STPL	82	429	0.1	12.8	-3.1	997.9	18.6
W2	STPL	82	430	0.7	12.5	3.0	997.4	8.1
W2	STPL	82	5 1	0.3	15.5	2.0	999.4	4.2
W2	STPL	82	5 2	0.1	18.0	1.4	997.5	9.4
W2	STPL	82	5 3	0.7	20.1	7.3	992.9	14.2
W2	STPL	82	5 4	0.9	22.1	13.8	986.7	23.1
W2	STPL	82	5 5	0.9	13.1	7.1	987.6	15.0
W2	STPL	82	5 6	0.8	9.2	5.4	984.7	14.8
W2	STPL	82	5 7	0.3	10.4	-0.5	984.9	13.3
W2	STPL	82	5 8	0.4	14.3	3.5	990.6	8.9
W2	STPL	82	5 9	0.8	17.2	9.9	989.4	19.8
W2	STPL	82	510	0.7	23.1	12.9	985.1	19.2
W2	STPL	82	511	0.5	16.9	10.3	989.6	12.8
W2	STPL	82	512	1.0	14.6	11.4	989.4	15.2
W2	STPL	82	513	1.0	19.1	16.5	988.5	13.7
W2	STPL	82	514	1.0	20.2	15.6	989.4	13.7
W2	STPL	82	515	0.6	18.8	13.0	990.3	12.6
W2	STPL	82	516	0.7	19.6	14.6	992.4	14.0
W2	STPL	82	517	0.9	18.3	15.4	988.7	16.3
W2	STPL	82	518	0.8	18.4	12.7	986.3	11.7
W2	STPL	82	519	0.2	18.4	11.8	987.9	11.1
W2	STPL	82	520	0.8	15.0	7.1	992.1	12.8
W2	STPL	82	521	1.0	13.8	5.3	991.5	19.6
W2	STPL	82	522	0.8	15.0	6.2	992.4	13.1
W2	STPL	82	523	0.4	14.8	7.7	994.0	7.2
W2	STPL	82	524	0.7	16.5	10.7	993.9	6.8

W2	STPL	82	525	0.9	17.0	11.2	991.3	6.8
W2	STPL	82	526	1.0	16.2	12.7	984.6	14.4
W2	STPL	82	527	0.8	18.8	14.9	985.6	12.0
W2	STPL	82	528	0.6	20.8	15.5	986.6	7.6
W2	STPL	82	529	0.8	20.2	16.0	984.9	5.7
W2	STPL	82	530	0.6	19.7	11.1	986.9	7.2
W2	STPL	82	531	0.6	15.2	6.8	985.4	22.0
W2	STPL	82	6 1	0.0	14.9	4.5	987.2	19.6
W2	STPL	82	6 2	0.5	13.1	2.9	993.2	12.5
W2	STPL	82	6 3	0.4	14.4	4.4	996.2	12.4
W2	STPL	82	6 4	0.1	16.0	5.2	994.6	12.3
W2	STPL	82	6 5	0.5	18.3	5.1	993.9	19.1
W2	STPL	82	6 6	0.8	17.5	10.6	987.1	26.5
W2	STPL	82	6 7	0.7	17.9	10.9	988.7	24.9
W2	STPL	82	6 8	0.4	18.3	9.9	991.4	12.1
W2	STPL	82	6 9	0.9	16.9	11.1	985.8	21.3
W2	STPL	82	610	0.0	16.7	4.4	992.8	19.4
W2	STPL	82	611	0.4	17.9	7.2	992.9	11.7
W2	STPL	82	612	0.2	17.6	5.8	992.5	16.8
W2	STPL	82	613	0.1	20.0	5.5	993.7	12.8
W2	STPL	82	614	0.7	18.2	12.5	987.4	14.1
W2	STPL	82	615	0.6	17.8	9.9	985.7	18.4
W2	STPL	82	616	0.4	19.3	9.0	987.7	13.9
W2	STPL	82	617	0.7	19.2	11.3	986.7	17.1
W2	STPL	82	618	0.8	15.9	6.4	990.9	11.4
W2	STPL	82	619	0.6	15.1	7.7	988.0	13.1
W2	STPL	82	620	0.7	15.9	10.0	984.3	17.5
W2	STPL	82	621	0.3	17.2	8.2	988.3	15.3
W2	STPL	82	622	0.3	17.9	7.5	993.3	6.0
W2	STPL	82	623	0.6	21.8	9.7	994.5	11.5
W2	STPL	82	624	1.0	21.9	14.7	991.8	12.8
W2	STPL	82	625	0.4	19.1	9.2	994.9	14.4
W2	STPL	82	626	0.6	18.6	10.0	995.4	9.4
W2	STPL	82	627	0.3	23.7	14.6	993.2	7.9
W2	STPL	82	628	0.5	24.1	15.4	989.2	9.9
W2	STPL	82	629	0.8	18.9	10.0	991.1	13.7
W2	STPL	82	630	0.4	19.6	6.6	997.9	7.7
W2	STPL	82	7 1	0.2	21.3	8.8	997.7	6.5
W2	STPL	82	7 2	0.8	22.0	14.5	990.7	9.6
W2	STPL	82	7 3	0.2	26.3	15.6	988.3	16.4
W2	STPL	82	7 4	0.2	28.5	14.1	990.4	11.9
W2	STPL	82	7 5	0.6	31.3	19.6	986.4	23.5
W2	STPL	82	7 6	0.9	23.7	18.4	983.5	22.4
W2	STPL	82	7 7	0.2	21.3	12.5	990.8	22.4
W2	STPL	82	7 8	0.4	22.4	13.3	994.9	15.7
W2	STPL	82	7 9	0.9	23.9	17.5	990.1	14.8
W2	STPL	82	710	1.0	17.8	14.5	985.7	17.4
W2	STPL	82	711	0.4	22.4	12.5	989.2	18.3
W2	STPL	82	712	0.3	24.1	13.9	993.8	9.6
W2	STPL	82	713	0.8	24.4	15.9	995.7	5.8
W2	STPL	82	714	0.4	26.1	17.0	994.1	10.6
W2	STPL	82	715	0.9	23.8	19.4	990.0	17.8
W2	STPL	82	716	0.6	27.3	20.7	988.0	22.1
W2	STPL	82	717	0.4	26.7	16.7	987.0	15.6
W2	STPL	82	718	0.3	24.1	12.5	990.2	12.2
W2	STPL	82	719	0.3	24.1	13.7	990.7	16.7
W2	STPL	82	720	0.4	25.6	19.4	993.5	15.3
W2	STPL	82	721	0.8	24.6	18.6	995.0	10.6
W2	STPL	82	722	0.1	25.6	17.2	999.2	11.7
W2	STPL	82	723	0.3	25.5	16.2	999.8	14.3

W2	STPL	82	724	0.7	26.0	19.1	995.2	21.8
W2	STPL	82	725	0.9	25.0	18.8	996.4	13.7
W2	STPL	82	726	0.9	22.8	16.3	997.9	14.2
W2	STPL	82	727	0.2	24.2	13.9	997.3	13.0
W2	STPL	82	728	0.3	24.0	12.3	998.3	11.0
W2	STPL	82	729	0.4	24.1	13.3	993.3	21.3
W2	STPL	82	730	0.3	22.7	13.7	994.5	18.0
W2	STPL	82	731	0.6	23.8	14.7	992.7	17.7
W2	STPL	82	8 1	0.6	25.7	18.0	989.8	15.8
W2	STPL	82	8 2	0.6	26.4	18.1	989.4	27.0
W2	STPL	82	8 3	0.8	29.5	20.5	988.5	22.1
W2	STPL	82	8 4	1.0	27.8	19.7	994.3	10.8
W2	STPL	82	8 5	0.6	26.9	20.0	999.5	13.4
W2	STPL	82	8 6	0.3	24.8	18.2	1000.8	9.2
W2	STPL	82	8 7	0.4	25.6	17.2	996.9	12.0
W2	STPL	82	8 8	0.2	21.9	10.7	993.3	24.6
W2	STPL	82	8 9	0.5	17.1	7.2	994.3	21.1
W2	STPL	82	810	0.4	17.5	6.3	998.7	10.9
W2	STPL	82	811	0.1	18.7	4.1	1000.4	9.3
W2	STPL	82	812	0.7	19.6	7.9	997.5	17.3
W2	STPL	82	813	0.9	19.8	15.3	994.2	9.3
W2	STPL	82	814	0.9	23.1	16.9	994.8	10.8
W2	STPL	82	815	0.7	23.8	17.1	995.5	8.6
W2	STPL	82	816	0.3	23.7	17.9	999.4	5.9
W2	STPL	82	817	0.4	25.0	17.8	1000.8	7.3
W2	STPL	82	818	0.3	25.7	19.4	996.4	15.5
W2	STPL	82	819	0.8	26.5	18.7	994.5	14.4
W2	STPL	82	820	0.0	23.2	10.2	1000.6	15.5
W2	STPL	82	821	0.4	22.8	12.8	998.0	16.0
W2	STPL	82	822	0.7	22.3	14.4	988.4	16.5
W2	STPL	82	823	0.5	21.4	12.5	991.6	11.3
W2	STPL	82	824	0.6	18.7	12.6	990.8	13.2
W2	STPL	82	825	0.2	20.8	11.7	992.5	19.7
W2	STPL	82	826	0.7	19.9	14.2	989.3	14.7
W2	STPL	82	827	0.1	14.6	4.9	996.1	13.8
W2	STPL	82	828	0.9	16.3	6.7	1000.4	16.1
W2	STPL	82	829	1.0	18.2	14.4	993.1	16.1
W2	STPL	82	830	0.3	19.4	10.4	996.0	14.2
W2	STPL	82	831	1.0	19.3	14.9	992.5	18.9
W2	STPL	82	9 1	0.8	21.9	15.8	989.7	14.3
W2	STPL	82	9 2	0.3	18.4	9.1	990.7	25.1
W2	STPL	82	9 3	0.2	17.8	7.9	995.5	13.3
W2	STPL	82	9 4	0.3	20.1	12.8	994.6	16.9
W2	STPL	82	9 5	0.9	19.1	14.5	993.8	13.9
W2	STPL	82	9 6	0.4	14.8	7.4	1001.8	15.7
W2	STPL	82	9 7	0.9	15.7	12.3	1001.2	14.1
W2	STPL	82	9 8	0.8	19.1	15.4	997.4	17.4
W2	STPL	82	9 9	0.9	22.8	18.3	993.1	18.9
W2	STPL	82	910	0.7	23.0	19.3	985.4	16.4
W2	STPL	82	911	0.3	24.1	19.3	986.0	15.4
W2	STPL	82	912	1.0	21.7	18.7	986.0	18.0
W2	STPL	82	913	1.0	14.1	10.4	991.1	13.5
W2	STPL	82	914	1.0	13.3	9.1	997.3	19.1
W2	STPL	82	915	1.0	10.7	6.3	997.9	15.1
W2	STPL	82	916	1.0	12.5	7.0	996.6	9.4
W2	STPL	82	917	0.8	14.4	10.1	991.1	12.6
W2	STPL	82	918	0.0	13.1	6.4	992.6	10.9
W2	STPL	82	919	0.4	13.1	6.0	988.7	15.3
W2	STPL	82	920	0.5	10.0	2.6	996.0	13.3
W2	STPL	82	921	0.1	10.5	3.6	999.5	6.0

W2	STPL	82 922	0.4	13.1	5.4	994.5	12.8
W2	STPL	82 923	0.6	17.0	9.4	985.8	19.7
W2	STPL	82 924	0.9	13.3	8.9	991.7	22.5
W2	STPL	82 925	0.5	10.8	4.1	994.6	9.3
W2	STPL	82 926	0.2	12.3	6.6	988.5	19.0
W2	STPL	82 927	0.4	13.2	8.1	986.7	18.8
W2	STPL	82 928	0.8	18.4	12.2	983.0	28.9
W2	STPL	82 929	0.8	21.1	15.9	987.8	24.7
W2	STPL	82 930	0.8	15.0	7.3	995.7	14.6
W2	STPL	8210 1	1.0	12.9	7.6	994.4	18.3
W2	STPL	8210 2	0.9	13.5	10.6	985.0	18.8
W2	STPL	8210 3	0.2	12.5	7.1	990.0	10.4
W2	STPL	8210 4	0.4	15.5	8.6	989.4	16.6
W2	STPL	8210 5	0.8	17.3	11.9	990.2	15.1
W2	STPL	8210 6	1.0	16.0	12.3	984.2	21.6
W2	STPL	8210 7	0.8	7.5	3.5	982.7	18.4
W2	STPL	8210 8	0.7	9.9	5.6	985.0	17.1
W2	STPL	8210 9	1.0	12.5	8.7	977.6	26.5
W2	STPL	821010	1.0	11.2	7.6	979.1	13.2
W2	STPL	821011	1.0	9.1	5.8	985.1	16.8
W2	STPL	821012	1.0	9.3	6.1	988.2	16.2
W2	STPL	821013	1.0	9.3	5.2	990.8	16.0
W2	STPL	821014	0.5	12.9	5.4	984.2	20.1
W2	STPL	821015	0.2	10.9	3.0	989.2	22.1
W2	STPL	821016	0.5	7.2	-0.4	995.0	12.0
W2	STPL	821017	0.4	12.2	3.7	988.1	21.3
W2	STPL	821018	0.7	13.5	7.8	985.6	14.8
W2	STPL	821019	1.0	8.0	4.9	985.9	28.6
W2	STPL	821020	0.7	2.3	-3.0	989.8	27.2
W2	STPL	821021	0.4	2.0	-4.2	1000.4	8.2
W2	STPL	821022	0.1	4.9	-0.9	999.5	16.7
W2	STPL	821023	0.2	8.3	0.7	998.9	18.5
W2	STPL	821024	0.3	10.4	0.8	998.2	22.0
W2	STPL	821025	0.3	11.6	2.2	997.4	15.5
W2	STPL	821026	0.7	11.3	1.1	995.9	19.4
W2	STPL	821027	0.9	10.8	2.6	986.1	26.7
W2	STPL	821028	1.0	10.6	5.9	978.4	18.8
W2	STPL	821029	0.9	10.6	2.1	977.4	28.1
W2	STPL	821030	0.4	6.0	-2.9	986.2	11.6
W2	STPL	821031	0.8	6.4	0.7	987.0	4.8
W2	STPL	8211 1	0.8	8.7	5.4	985.6	10.0
W2	STPL	8211 2	0.8	6.5	3.4	984.7	9.6
W2	STPL	8211 3	1.0	0.4	-4.3	986.2	32.0
W2	STPL	8211 4	1.0	-1.4	-6.1	987.2	29.7
W2	STPL	8211 5	1.0	-1.8	-6.8	990.2	21.4
W2	STPL	8211 6	0.7	1.3	-5.1	987.0	14.7
W2	STPL	8211 7	0.5	5.4	-0.5	985.0	15.8
W2	STPL	8211 8	0.7	2.1	-3.8	997.0	15.7
W2	STPL	8211 9	1.0	2.5	-0.5	998.5	23.8
W2	STPL	821110	1.0	3.3	0.6	987.9	20.5
W2	STPL	821111	1.0	2.7	-0.2	977.3	19.1
W2	STPL	821112	0.7	-2.0	-9.4	980.0	40.4
W2	STPL	821113	0.8	-6.7	-13.5	992.2	14.5
W2	STPL	821114	0.5	-7.7	-11.6	992.9	16.8
W2	STPL	821115	0.3	-2.7	-7.9	987.5	23.8
W2	STPL	821116	0.1	-1.9	-5.8	984.7	8.2
W2	STPL	821117	0.5	0.3	-3.6	985.8	15.4
W2	STPL	821118	0.4	5.6	1.6	986.6	20.4
W2	STPL	821119	1.0	10.1	8.1	981.5	20.2
W2	STPL	821120	1.0	10.8	4.6	978.0	29.8

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W2 STPL  821121        0.5     1.3    -7.0    992.2    11.8
W2 STPL  821122        1.0      .5    -4.7    991.7    18.2
W2 STPL  821123        0.3    -9.9   -14.4    992.1    21.9
W2 STPL  821124        0.0    -6.9   -11.9    994.7    22.8
W2 STPL  821125        0.6    -2.3    -6.5    992.3    10.5
W2 STPL  821126        0.2    -8.2   -16.2    998.4    18.1
W2 STPL  821127        0.4    -5.8   -12.3    996.2    15.1
W2 STPL  821128        1.0    -1.2    -4.4    977.1    10.6
W2 STPL  821129        1.0     1.1    -0.8    976.1    10.9
W2 STPL  821130        1.0     3.3     1.3    977.5    18.2
W2 STPL  8212 1        1.0     6.8     5.2    979.5    18.5
W2 STPL  8212 2        0.7    13.0     9.7    978.4    25.1
W2 STPL  8212 3        0.5     1.5    -2.5    982.7    16.4
W2 STPL  8212 4        1.0     0.9    -2.3    986.5    10.0
W2 STPL  8212 5        0.8     1.4    -2.9    979.1    19.4
W2 STPL  8212 6        0.2    -1.9    -8.2    987.1    19.8
W2 STPL  8212 7        0.6    -7.5   -14.4   1002.4    12.7
W2 STPL  8212 8        0.4   -10.7   -19.4   1009.0    17.1
W2 STPL  8212 9        0.6   -10.9   -20.6    998.1    21.8
W2 STPL  821210        0.3    -5.9   -13.0    988.3    23.2
W2 STPL  821211        0.0   -13.2   -18.6    994.8    15.7
W2 STPL  821212        0.3   -10.5   -17.7    988.2    12.9
W2 STPL  821213        0.6    -2.0    -6.7    975.8    19.3
W2 STPL  821214        1.0     0.1    -1.7    978.1    12.7
W2 STPL  821215        0.9    -1.6    -3.8    988.6    13.6
W2 STPL  821216        0.0    -6.4    -9.0    994.7     6.3
W2 STPL  821217        0.8    -2.0    -5.0    981.2    20.2
W2 STPL  821218        1.0     0.8    -1.8    971.0    15.1
W2 STPL  821219        1.0    -0.9    -5.2    981.2    22.0
W2 STPL  821220        0.5    -3.2    -7.0    985.7    11.4
W2 STPL  821221        0.7    -3.9    -6.8    983.7    16.9
W2 STPL  821222        0.8     0.2    -2.6    978.8    19.4
W2 STPL  821223        1.0     2.5     0.4    976.2    16.1
W2 STPL  821224        1.0     3.0     0.7    981.4    17.4
W2 STPL  821225        0.7    -1.2    -3.9    983.1    24.1
W2 STPL  821226        0.0    -5.3    -9.1    994.0    10.1
W2 STPL  821227        0.9    -2.0    -4.0    985.2    17.1
W2 STPL  821228        0.9    -8.4   -10.6    974.6    37.6
W2 STPL  821229        0.5   -15.0   -18.1    986.7    10.8
W2 STPL  821230        0.9   -11.0   -12.8    987.5    10.7
W2 STPL  821231        0.8    -5.5    -9.1    984.2    19.1
FISH HAR     8760        2
               0.        0.
               0.        0.
OUTL1          24      354
OUTL3   EG   81 12       1    .368       2    0.000       3    0.000       4    0.000
WRFLO2EG      .00
OUTL3   EG   81 13       1    .368       2    0.000       3    0.000       4    0.000
WRFLO2EG      .00
OUTL3   EG   81 14       1    .368       2    0.000       3    0.000       4    0.000
WRFLO2EG      .00
OUTL3   EG   81 15       1    .368       2    0.000       3    0.000       4    0.000
WRFLO2EG      .00
OUTL3   EG   81 16       1    .368       2    0.000       3    0.000       4    0.000
WRFLO2EG      .00
OUTL3   EG   81 17       1    .368       2    0.000       3    0.000       4    0.000
WRFLO2EG      .00
OUTL3   EG   81 18       1    .368       2    0.000       3    0.000       4    0.000
WRFLO2EG      .00
OUTL3   EG   81 19       1    .368       2    0.000       3    0.000       4    0.000
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WRFLO2EG	.00								
OUTL3 EG	81 20	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 21	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 22	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 23	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 24	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
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WRFLO2EG	.00								
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WRFLO2EG	.00								
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WRFLO2EG	.00								
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WRFLO2EG	.00								
OUTL3 EG	81 29	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 30	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 31	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 32	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 33	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 34	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 35	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 36	1	.368	2	0.000	3	0.000	4	0.000
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WRFLO2EG	.00								
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WRFLO2EG	.00								
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WRFLO2EG	.00								
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WRFLO2EG	.00								
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WRFLO2EG	.00								
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WRFLO2EG	.00								
OUTL3 EG	81 45	1	.368	2	0.000	3	0.000	4	0.000
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OUTL3 EG	81 46	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 47	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 48	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 49	1	.368	2	0.000	3	0.000	4	0.000

WRFLO2EG	.00								
OUTL3 EG	81 50	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 51	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 52	1	.368	2	0.000	3	0.000	4	0.000
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WRFLO2EG	.00								
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WRFLO2EG	.00								
OUTL3 EG	81 59	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 60	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 61	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 62	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
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WRFLO2EG	.00								
OUTL3 EG	81 64	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 65	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 66	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 67	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
OUTL3 EG	81 68	1	.368	2	0.000	3	0.000	4	0.000
WRFL082	.00								
OUTL3 EG	81 69	1	.368	2	0.000	3	0.000	4	0.000
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WRFLO2EG	.00								
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WRFLO2EG	.00								
OUTL3 EG	81 72	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	.00								
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WRFLO2EG	.028								
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WRFLO2EG	.085								
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WRFLO2EG	.085								
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WRFLO2EG	.085								
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WRFLO2EG	.085								
OUTL3 EG	81 78	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.085								
OUTL3 EG	81 79	1	.38	2	0.000	3	0.000	4	0.000

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WRFLO2EG     .085
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WRFLO2EG     .170
OUTL3   EG  81 82      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .312
OUTL3   EG  81 83      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .736
OUTL3   EG  81 84      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     2.44
OUTL3   EG  81 85      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     3.85
OUTL3   EG  81 86      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     3.14
OUTL3   EG  81 87      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     1.87
OUTL3   EG  81 88      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     2.44
OUTL3   EG  81 89      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     22.0
OUTL3   EG  81 90      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     35.1
OUTL3   EG  81 91      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     19.4
OUTL3   EG  81 92      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     5.27
OUTL3   EG  81 93      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     4.13
OUTL3   EG  81 94      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     3.57
OUTL3   EG  81 95      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     2.01
OUTL3   EG  81 96      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EC     1.02
OUTL3   EG  81 97      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .736
OUTL3   EG  81 98      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .453
OUTL3   EG  81 99      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .453
OUTL3   EG  81100      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .453
OUTL3   EG  81101      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .453
OUTL3   EG  81102      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .453
OUTL3   EG  81103      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .453
OUTL3   EG  81104      1    .38     2   0.000     3   0.000     4   0.000
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OUTL3   EG  81105      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .453
OUTL3   EG  81106      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     .453
OUTL3   EG  81107      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     4.13
OUTL3   EG  81108      1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG     4.98
OUTL3   EG  81109      1    .38     2   0.000     3   0.000     4   0.000
```

WRFLO2EG	1.81								
OUTL3 EG	81110	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.14								
OUTL3 EG	81111	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.29								
OUTL3 EG	81112	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.33								
OUTL3 EG	81113	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.62								
OUTL3 EG	81114	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.536								
OUTL3 EG	81115	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.103								
OUTL3 EG	81116	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.103								
OUTL3 EG	81117	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.103								
OUTL3 EG	81118	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.103								
OUTL3 EG	81119	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.103								
OUTL3 EG	81120	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.103								
OUTL3 EG	81121	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.160								
OUTL3 EG	81122	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.160								
OUTL3 EG	81123	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.160								
OUTL3 EG	81124	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.160								
OUTL3 EG	81125	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.636								
OUTL3 EG	81126	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.49								
OUTL3 EG	81127	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	2.34								
OUTL3 EG	81128	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	2.34								
OUTL3 EG	81129	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.02								
OUTL3 EG	81130	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	2.05								
OUTL3 EG	81131	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	2.34								
OUTL3 EG	81132	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.02								
OUTL3 EG	81133	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.636								
OUTL3 EG	81134	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.77								
OUTL3 EG	81135	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	2.34								
OUTL3 EG	81136	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.77								
OUTL3 EG	81137	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	1.02								
OUTL3 EG	81138	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.736								
OUTL3 EG	81139	1	.38	2	0.000	3	0.000	4	0.000

WRFLO2EG	.736								
OUTL3 EG	81140	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.736								
OUTL3 EG	81141	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.736								
OUTL3 EG	81142	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81143	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81144	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81145	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81146	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81147	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81148	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81149	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81150	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81151	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81152	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.227								
OUTL3 EG	81153	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.198								
OUTL3 EG	81154	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.170								
OUTL3 EG	81155	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.170								
OUTL3 EG	81156	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.142								
OUTL3 EG	81157	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.113								
OUTL3 EG	81158	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.113								
OUTL3 EG	81159	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.113								
OUTL3 EG	81160	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.113								
OUTL3 EG	81161	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.113								
OUTL3 EG	81162	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.113								
OUTL3 EG	81163	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.113								
OUTL3 EG	81164	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.113								
OUTL3 EG	81165	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.085								
OUTL3 EG	81166	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.113								
OUTL3 EG	81167	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.142								
OUTL3 EG	81168	1	.38	2	0.000	3	0.000	4	0.000
WRFLO2EG	.142								
OUTL3 EG	81169	1	.38	2	0.000	3	0.000	4	0.000

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WRFLO2EG     .142
OUTL3  EG   81170      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .113
OUTL3  EG   81171      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .113
OUTL3  EG   81172      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .113
OUTL3  EG   81173      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .113
OUTL3  EG   81174      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .085
OUTL3  EG   81175      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .085
OUTL3  EG   81176      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .113
OUTL3  EG   81177      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .113
OUTL3  EG   81178      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .113
OUTL3  EG   81179      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .085
OUTL3  EG   81180      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .113
OUTL3  EG   81181      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .113
OUTL3  EG   81182      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .085
OUTL3  EG   81183      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .057
OUTL3  EG   81184      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .057
OUTL3  EG   81185      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .057
OUTL3  EG   81186      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .057
OUTL3  EG   81187      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .028
OUTL3  EG   81188      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .028
OUTL3  EG   81189      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .028
OUTL3  EG   81190      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .000
OUTL3  EG   81191      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .085
OUTL3  EG   81192      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .142
OUTL3  EG   81193      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .113
OUTL3  EG   81194      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .057
OUTL3  EG   81195      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     0.0
OUTL3  EG   81196      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     0.0
OUTL3  EG   81197      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .028
OUTL3  EG   81198      1     .38     2    0.000     3    0.000     4    0.000
WRFLO2EG     .057
OUTL3  EG   81199      1     .38     2    0.000     3    0.000     4    0.000
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WRFLO2EG     .028
OUTL3   EG  81200        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG     .028
OUTL3   EG  81201        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81202        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG     .000
OUTL3   EG  81203        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG     .000
OUTL3   EG  81204        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG     .028
OUTL3   EG  81205        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81206        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81207        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG     .085
OUTL3   EG  81208        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG     .113
OUTL3   EG  81209        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG     .057
OUTL3   EG  81210        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG     .028
OUTL3   EG  81211        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81212        1     .368        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81213        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81214        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81215        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81216        1      .38        2   0.000        3   0.000        4   0.000
WRFLO2EG    1.02
OUTL3   EG  81217        1      .45        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81218        1      .45        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81219        1      .25        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81220        1      .25        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81221        1      .25        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81222        1      .25        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81223        1      1.2        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81224        1     .330        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81225        1     .330        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81226        1     .330        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81227        1     .330        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81228        1     .330        2   0.000        3   0.000        4   0.000
WRFLO2EG    0.0
OUTL3   EG  81229        1     .330        2   0.000        3   0.000        4   0.000
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WRFLO2EG	0.0								
OUTL3 EG	81230	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81231	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81232	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81233	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81234	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81235	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81236	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81237	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81238	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81239	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81240	1	.330	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81241	1	.36	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81242	1	.36	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81243	1	.36	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81244	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.000								
OUTL3 EG	81245	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.000								
OUTL3 EG	81246	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.057								
OUTL3 EG	81247	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81248	1	.368	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.								
OUTL3 EG	81249	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81250	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81251	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81252	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81253	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.028								
OUTL3 EG	81254	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.057								
OUTL3 EG	81255	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.113								
OUTL3 EG	81256	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.170								
OUTL3 EG	81257	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.453								
OUTL3 EG	81258	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.312								
OUTL3 EG	81259	1	.39	2	0.000	3	0.000	4	0.000

WRFLO2EG	.113								
OUTL3 EG	81260	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.028								
OUTL3 EG	81261	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.057								
OUTL3 EG	81262	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.057								
OUTL3 EG	81263	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.057								
OUTL3 EG	81264	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.028								
OUTL3 EG	81265	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81266	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81267	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81268	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81269	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81270	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81271	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81272	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	0.0								
OUTL3 EG	81273	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.028								
OUTL3 EG	81274	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.028								
OUTL3 EG	81275	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.028								
OUTL3 EG	81276	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.028								
OUTL3 EG	81277	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.028								
OUTL3 EG	81278	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.028								
OUTL3 EG	81279	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.028								
OUTL3 EG	81280	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.170								
OUTL3 EG	81281	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.255								
OUTL3 EG	81282	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.283								
OUTL3 EG	81283	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.255								
OUTL3 EG	81284	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.170								
OUTL3 EG	81285	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.170								
OUTL3 EG	81286	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.085								
OUTL3 EG	81287	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.085								
OUTL3 EG	81288	1	.39	2	0.000	3	0.000	4	0.000
WRFLO2EG	.085								
OUTL3 EG	81289	1	.39	2	0.000	3	0.000	4	0.000

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WRFLO2EG    .085
OUTL3  EG  81290     1    .39     2   0.000     3   0.000     4   0.000
WRFLO2EG    .085
OUTL3  EG  81291     1    .39     2   0.000     3   0.000     4   0.000
WRFLO2EG    .085
OUTL3  EG  81292     1    .39     2   0.000     3   0.000     4   0.000
WRFLO2EG    .085
OUTL3  EG  81293     1    .39     2   0.000     3   0.000     4   0.000
WRFLO2EG    2.80
OUTL3  EG  81294     1    .39     2   0.000     3   0.000     4   0.000
WRFLO2EG    4.30
OUTL3  EG  81295     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    2.04
OUTL3  EG  81296     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    .651
OUTL3  EG  81297     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    .368
OUTL3  EG  81298     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    .170
OUTL3  EG  81299     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    .170
OUTL3  EG  81300     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    .170
OUTL3  EG  81301     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    .170
OUTL3  EG  81302     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    .170
OUTL3  EG  81303     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    .170
OUTL3  EG  81304     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    .170
OUTL3  EG  81305     1    .38     2   0.000     3   0.000     4   0.000
WRFLO2EG    .170
OUTL3  EG  81306     1    2.4     2   0.000     3   0.000     4   0.000
WRFLO2EG    0.0
OUTL3  EG  81307     1    .11     2   0.000     3   0.000     4   0.000
WRFLO2EG    0.0
OUTL3  EG  81308     1    .11     2   0.000     3   0.000     4   0.000
WRFLO2EC    0.0
OUTL3  EG  81309     1    .34     2   0.000     3   0.000     4   0.000
WRFLO2EG    0.0
OUTL3  EG  81310     1    .34     2   0.000     3   0.000     4   0.000
WRFLO2EG    0.0
OUTL3  EG  81311     1    .34     2   0.000     3   0.000     4   0.000
WRFLO2EG    0.0
OUTL3  EG  81312     1    .34     2   0.000     3   0.000     4   0.000
WRFLO2EG    0.0
OUTL3  EG  81313     1    .34     2   0.000     3   0.000     4   0.000
WRFLO2EG    0.0
OUTL3  EG  81314     1    .390    2   0.000     3   0.000     4   0.000
WRFLO2EG    .000
OUTL3  EG  81315     1    .390    2   0.000     3   0.000     4   0.000
WRFLO2EG    2.75
OUTL3  EG  81316     1    .390    2   0.000     3   0.000     4   0.000
WRFLO2EG    12.5
OUTL3  EG  81317     1    .390    2   0.000     3   0.000     4   0.000
WRFLO2EG    14.1
OUTL3  EG  81318     1    .390    2   0.000     3   0.000     4   0.000
WRFLO2EG    4.76
OUTL3  EG  81319     1    .390    2   0.000     3   0.000     4   0.000
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WRFLO2EG    1.25
OUTL3  EG  81320      1    .390      2   0.000      3   0.000      4   0.000
WRFLO2EG    .510
OUTL3  EG  81321      1    .390      2   0.000      3   0.000      4   0.000
WRFLO2EG    .368
OUTL3  EG  81322      1    .390      2   0.000      3   0.000      4   0.000
WRFLO2EG    .311
OUTL3  EG  81323      1    .390      2   0.000      3   0.000      4   0.000
WRFLO2EG    .311
OUTL3  EG  81324      1    .390      2   0.000      3   0.000      4   0.000
WRFLO2EG    .453
OUTL3  EG  81325      1    .390      2   0.000      3   0.000      4   0.000
WRFLO2EG    2.49
OUTL3  EG  81326      1    .390      2   0.000      3   0.000      4   0.000
WRFLO2EG    2.83
OUTL3  EG  81327      1    .390      2   0.000      3   0.000      4   0.000
WRFLO2EG    .963
OUTL3  EG  81328      1    .390      2   0.000      3   0.000      4   0.000
WRFLO2EG    .623
OUTL3  EG  81329      1    .390      2   0.000      3   0.000      4   0.000
WRFLO2EG    .453
OUTL3  EG  81330      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .311
OUTL3  EG  81331      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .227
OUTL3  EG  81332      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .227
OUTL3  EG  81333      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .227
OUTL3  EG  81334      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .227
OUTL3  EG  81335      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .198
OUTL3  EG  81336      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .198
OUTL3  EG  81337      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .198
OUTL3  EG  81338      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .198
OUTL3  EG  81339      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .198
OUTL3  EG  81340      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .198
OUTL3  EG  81341      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .198
OUTL3  EG  81342      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .198
OUTL3  EG  81343      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .113
OUTL3  EG  81344      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .113
OUTL3  EG  81345      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .113
OUTL3  EG  81346      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .113
OUTL3  EG  81347      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .113
OUTL3  EG  81348      1     .39      2   0.000      3   0.000      4   0.000
WRFLO2EG    .113
OUTL3  EG  81349      1     .39      2   0.000      3   0.000      4   0.000
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WRFLO2EG     .113
OUTL3  EG  81350        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     .113
OUTL3  EG  81351        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     .113
OUTL3  EG  81352        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     .113
OUTL3  EG  81353        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     .113
OUTL3  EG  81354        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     .113
OUTL3  EG  81355        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     .113
OUTL3  EG  81356        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     .113
OUTL3  EG  81357        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     .113
OUTL3  EG  81358        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     .113
OUTL3  EG  81359        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     2.15
OUTL3  EG  81360        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     3.85
OUTL3  EG  81361        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     2.01
OUTL3  EG  81362        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     1.30
OUTL3  EG  81363        1      .39        2   0.000        3   0.000        4   0.000
WRLO2EG     .736
OUTL3  EG  81364        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     1.70
OUTL3  EG  81365        1      .39        2   0.000        3   0.000        4   0.000
WRFLO2EG     1.70
Q1 TRIB1       24       36
            0.288    0.288    0.288    0.288    0.288    0.288    0.288    0.288    0.288
            0.288    0.280    0.280    0.280    0.280    0.280    0.280    0.280    0.294
            0.294    0.294    0.294    0.294    0.294    0.294    0.294    0.294    0.294
            0.294    0.294    0.294    0.294    0.293    0.293    0.293    0.293    0.293
            0.293    0.293    0.290    0.290    0.290    0.290    0.290    0.290    0.290
            0.282    0.282    0.282    0.327    0.327    0.327    0.327    0.327    0.327
            0.327    0.327    0.327    0.327    0.327    0.327    0.327    0.340    0.385
            0.409    0.409    0.409    0.485    0.485    0.485    0.710    0.838    2.022
            3.639    3.544    2.886    5.057    5.588   23.880   33.623   16.157    2.973
            1.353    3.640    2.163    1.210    0.943    0.810    0.748    0.748    0.748
            0.748    0.748    0.748    0.748    3.570    7.139    4.947    2.056    1.513
            1.749    1.749    0.942    0.704    0.362    0.362    0.238    0.238    0.238
            0.252    0.484    0.484    0.969    0.969    1.472    2.234    3.153    1.794
            0.553    4.565    1.605    0.264    0.624    0.527    2.228    1.687    0.886
            0.716    1.583    0.749    0.688    0.618    0.618    0.618    0.618    0.618
            0.618    0.605    0.605    0.605    0.605    0.532    0.507    0.482    0.475
            0.415    0.428    0.428    0.605    0.605    0.532    0.507    0.428    0.428
            0.404    0.428    0.452    0.452    0.444    0.422    0.444    0.444    0.421
            0.397    0.397    0.417    0.393    0.393    0.372    0.393    0.393    0.393
            0.365    0.365    0.365    0.365    0.342    0.342    0.342    0.325    0.395
            0.442    0.419    0.372    0.325    0.325    0.395    0.372    0.349    0.349
            0.325    0.325    0.349    0.347    0.323    0.323    0.486    0.392    0.347
            0.323    0.296    0.273    0.318    0.318    0.318    0.192    0.342    0.335
            0.312    0.312    0.312    0.312    0.134    0.312    0.312    0.312    0.311
            0.312    0.312    0.312    0.312    0.310    0.310    0.310    0.310    0.310
            0.332    0.332    0.339    0.339    0.429    0.429    0.429    0.519    0.564
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           0.359     0.314     0.292     0.314     0.314     0.314     0.314     0.402     0.426
           0.640     0.686     0.592     0.473     0.402     0.298     0.366     0.366     0.366
           0.344     0.320     0.320     0.318     0.318     0.318     0.318     0.318     0.318
           0.342     0.363     0.363     0.363     0.363     0.363     0.436     0.678     0.772
           0.498     0.473     0.398     0.498     0.423     0.423     0.463     0.463     0.463
           0.463     0.463     5.742     3.756     1.225     0.563     0.513     0.489     0.489
           0.489     0.489     0.489     0.489     0.489     0.102     0.792     0.102     0.101
           0.623     0.623     0.623     0.623     0.623     0.850     5.870    15.834    11.657
           7.972     0.102     1.196     1.060     1.006     0.843     0.979     4.732     2.121
           0.294     0.834     0.687     0.564     0.492     0.492     0.492     0.492     0.100
ALG1        8760         1
              0.        0.
ALG2        8760         1
              0.        0.
ALG3        8760         1
              0.        0.
T182ALK      336         3
         205.140   201.380   199.060   196.740   161.710   126.620   133.030   124.400   261.000
         223.700   280.000   193.220   196.100   191.340   192.460   193.460   186.040   195.100
         198.800   188.140   198.100      198.      198.      198.
T182DOC      336         3
           1.094     1.640     1.464     1.294     6.542    11.790     5.600     4.292     1.958
           5.646     1.482     1.570     1.582     1.676     2.436     1.764     1.400     1.018
           1.300     0.824     1.658       1.6       1.6       1.6
T182NH4      336         3
           0.012     0.011     0.008     0.004     0.417     0.830     0.416     0.049     0.028
           0.007     0.016     0.043     0.000     0.029     0.038     0.031     0.019     0.021
           0.009     0.019     0.000
T182NO3      336         3
           1.954     1.960     1.776     1.591     1.426     1.260     1.363     1.466     0.887
           1.043     0.941     1.184     0.718     0.475     1.005     0.903     0.936     1.061
           1.029     1.941     1.092       1.0       1.0       1.0
WQ1 DUMY    8760         1
              0.        0.
T182COLI     336         3
           3.290     1.880     2.632     3.384   260.246   517.108     9.510   141.5761098.150
        2055.200    31.980    33.120    46.640    61.640    75.460    31.580    53.100    28.800
          54.120    32.870    12.220       12.       12.       12.
DET         8760         1
              2.        2.
T182DO       168         6
          11.648    11.828    12.164    13.282    12.034    14.448    12.196    13.466    13.706
          12.508    13.284    12.918    12.552    11.472    13.118    12.320    10.206    10.772
          11.400    11.050     9.790     8.662     8.832     8.902     8.156     7.186     7.896
           8.602     8.394     7.896     9.390    10.814     7.612     7.836    10.120     8.506
           8.694     9.932     8.076     8.884     8.634        9.        9.        9.        9.
              9.        9.        9.
T182SRP      336        36
           0.014     0.014     0.014     0.014     0.014     0.014     0.014     0.014     0.014
           0.014     0.014     0.014     0.014     0.014     0.014     0.014     0.014     0.014
           0.014     0.014     0.014     0.014     0.014     0.014     0.014     0.014     0.014
           0.014     0.014     0.014     0.014     0.014     0.014     0.014     0.014     0.014
           0.014     0.014     0.014     0.014     0.014     0.014     0.014     0.014     0.014
           0.014     0.014     0.014     0.016     0.016     0.016     0.016     0.016     0.016
           0.016     0.016     0.016     0.016     0.016     0.015     0.015     0.016     0.017
           0.017     0.017     0.017     0.016     0.016     0.016     0.021     0.024     0.051
           0.087     0.087     0.072     0.122     0.134     0.557     0.782     0.379     0.072
           0.036     0.087     0.054     0.033     0.027     0.024     0.024     0.024     0.024
           0.024     0.024     0.024     0.024     0.084     0.162     0.114     0.050     0.039
           0.041     0.041     0.028     0.026     0.015     0.015     0.012     0.012     0.012
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	0.012	0.017	0.017	0.029	0.029	0.042	0.060	0.077	0.046
	0.016	0.107	0.042	0.011	0.020	0.015	0.056	0.044	0.025
	0.019	0.041	0.022	0.023	0.021	0.021	0.021	0.021	0.021
	0.021	0.022	0.022	0.022	0.022	0.020	0.019	0.018	0.018
	0.017	0.017	0.017	0.021	0.021	0.019	0.019	0.017	0.017
	0.016	0.017	0.018	0.018	0.018	0.017	0.018	0.018	0.017
	0.017	0.017	0.017	0.017	0.017	0.016	0.017	0.017	0.017
	0.016	0.016	0.016	0.016	0.015	0.015	0.015	0.015	0.017
	0.018	0.017	0.016	0.015	0.015	0.017	0.016	0.015	0.015
	0.015	0.015	0.015	0.015	0.015	0.015	0.019	0.017	0.015
	0.015	0.014	0.014	0.015	0.015	0.015	0.008	0.015	0.016
	0.015	0.015	0.015	0.015	0.010	0.015	0.015	0.015	0.015
	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
	0.016	0.016	0.016	0.016	0.018	0.018	0.018	0.021	0.022
	0.016	0.015	0.014	0.015	0.015	0.015	0.015	0.017	0.017
	0.023	0.024	0.022	0.018	0.017	0.014	0.016	0.016	0.016
	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
	0.015	0.015	0.015	0.015	0.015	0.015	0.017	0.023	0.025
	0.018	0.017	0.016	0.018	0.016	0.016	0.016	0.016	0.016
	0.016	0.016	0.133	0.089	0.033	0.020	0.019	0.018	0.018
	0.018	0.018	0.018	0.018	0.018	0.007	0.027	0.007	0.007
	0.007	0.007	0.007	0.007	0.007	0.012	0.135	0.356	0.263
	0.182	0.007	0.032	0.029	0.028	0.024	0.027	0.111	0.053
	0.013	0.027	0.023	0.020	0.018	0.018	0.018	0.018	0.007
T182SI	336	3							
	12.639	13.709	12.714	11.710	10.700	9.691	9.335	8.810	8.456
	5.103	3.851	8.870	11.722	12.522	12.274	11.222	11.551	11.106
	11.364	10.424	9.754	9.7	9.7	9.7			
TEMP	24	36							
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
	7.00	8.16	8.16	9.90	11.06	9.90	9.90	8.16	7.00
	8.16	9.32	9.32	9.32	9.32	9.90	9.32	9.32	9.32
	9.32	9.32	9.90	9.90	9.90	16.28	12.22	12.80	9.90
	13.38	16.86	11.06	10.48	16.86	19.76	16.86	11.06	10.48
	18.02	11.06	10.48	9.90	9.32	10.48	10.94	12.22	13.96
	14.54	14.54	13.38	13.38	12.80	12.80	12.22	12.22	12.22
	12.80	12.22	15.12	13.38	12.22	13.96	13.96	14.54	13.96
	11.64	12.80	12.80	13.38	12.80	12.22	12.80	13.96	13.38
	13.96	13.38	15.70	15.12	15.70	18.02	17.44	17.44	16.86
	16.86	20.34	20.34	22.31	24.40	22.08	19.76	19.76	18.02
	19.18	20.34	18.60	20.92	19.18	19.76	23.24	22.08	20.34
	20.92	19.76	16.86	18.60	19.76	20.34	17.44	16.28	14.54
	14.54	15.70	14.54	13.38	13.38	16.28	15.70	18.02	16.28
	17.44	17.44	16.28	15.70	15.70	15.70	16.28	16.28	16.28
	16.28	16.28	16.28	16.28	16.28	16.28	16.28	15.12	16.86
	16.86	16.86	15.70	16.86	15.70	16.86	17.44	16.86	16.86
	16.28	16.86	18.02	17.44	17.44	18.02	18.02	16.28	16.86
	16.28	11.64	9.32	12.80	15.12	16.86	16.28	16.86	16.86
	17.44	17.44	16.86	18.60	18.02	17.44	16.86	16.86	16.86
	16.86	17.09	18.83	19.41	18.37	16.05	12.92	10.13	9.09
	9.09	9.09	8.86	8.39	8.28	9.20	9.09	7.23	8.04

	8.86	8.39	7.29	6.94	6.64	5.61	6.30	7.12	7.46
	7.00	7.35	7.70	7.12	6.07	7.23	6.65	5.03	2.24
	2.01	3.17	4.45	4.10	3.95	3.90	3.70	4.20	4.10
	3.80	1.80	2.50	2.10	2.50	2.36	2.82	2.94	1.90
	1.78	1.08	0.85	1.40	1.40	1.40	1.40	1.40	1.40
TDS	8760	1							
	260.	260.							
T182SS	336	3							
	1.960	2.550	2.891	3.222	4.598	5.880	2.720	5.958	3.276
	12.820	0.778	1.180	1.650	2.120	1.958	3.258	1.342	0.658
	10.340	2.590	5.410	5.4	5.4	5.4			
T182PH	168	6							
	8.094	8.288	8.294	7.384	7.694	7.564	7.606	7.694	7.700
	7.806	7.718	7.906	8.094	8.200	8.400	8.400	8.300	8.112
	7.260	7.918	8.312	7.718	7.894	7.900	8.300	8.400	8.588
	8.376	7.248	8.200	8.200	7.900	7.976	7.906	7.888	7.894
	7.894	8.306	7.912	8.218	8.006	8.000	7.802	8.	8.
	8.	8.							
ANATRIB1	336	25							
TRIB1	0.00	0.00	0.00	0.00	.0	9.00	.0		
TRIB1	0.00	0.00	0.20	0.00	.0	9.00	.0		
TRIB1	0.00	0.00	0.15	0.00	.0	9.00	.0		
TRIB1	0.00	0.00	0.10	0.00	.0	8.53	.0		
TRIB1	0.00	0.00	0.05	0.00	.0	10.50	.0		
TRIB1	0.01	0.00	0.00	0.00	.0	12.60	.0		
TRIB1	0.00	0.00	0.01	0.00	.0	10.54	.0		
TRIB1	0.00	0.00	0.30	0.00	.0	14.44	.0		
TRIB1	0.09	0.00	0.40	0.00	.0	9.87	.0		
TRIB1	0.50	0.00	0.09	0.00	.0	14.60	.0		
TRIB1	0.00	0.00	0.00	0.00	.0	12.57	.0		
TRIB1	0.00	0.00	0.10	0.00	.0	15.62	.0		
TRIB1	0.00	0.00	0.10	0.00	.0	13.42	.0		
TRIB1	0.00	0.00	0.10	0.00	.0	12.75	.0		
TRIB1	0.00	0.00	0.00	0.00	.0	11.35	.0		
TRIB1	0.00	0.00	0.10	0.00	.0	15.34	.0		
TRIB1	0.00	0.00	0.20	0.00	.0	12.45	.0		
TRIB1	0.00	0.00	0.10	0.00	.0	13.92	.0		
TRIB1	0.48	0.00	0.40	0.00	.0	14.16	.0		
TRIB1	0.09	0.00	0.00	0.00	.0	10.55	.0		
TRIB1	0.00	0.00	0.20	0.00	.0	10.12	.0		
TRIB1	0.01	0.00	0.01	0.00	.0	9.55	.0		
TRIB1	0.00	0.00	0.19	0.00	.0	8.43	.0		
TRIB1	0.00	0.00	0.10	0.00	.0	8.87	.0		
TRIB1	0.00	0.00	0.00	0.00	.0	8.37	.0		
Q1 TRIB2	24	36							
	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
	0.080	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.074
	0.074	0.074	0.074	0.074	0.074	0.074	0.074	0.074	0.074
	0.074	0.074	0.074	0.074	0.075	0.075	0.075	0.075	0.075
	0.075	0.075	0.082	0.082	0.082	0.082	0.082	0.082	0.082
	0.085	0.085	0.085	0.098	0.098	0.098	0.098	0.097	0.097
	0.097	0.097	0.097	0.097	0.097	0.085	0.085	0.085	0.096
	0.101	0.101	0.101	0.024	0.024	0.024	0.035	0.042	0.102
	0.184	0.246	0.201	0.350	0.388	1.660	2.338	1.123	0.147
	0.067	0.180	0.107	0.060	0.047	0.040	0.102	0.102	0.102
	0.102	0.102	0.102	0.102	0.110	0.221	0.153	0.064	0.047
	0.051	0.051	0.149	0.247	0.064	0.064	0.042	0.042	0.042
	0.029	0.056	0.056	0.111	0.111	0.169	0.256	0.187	0.106
	0.027	0.265	0.095	0.016	0.038	0.023	0.122	0.093	0.049
	0.034	0.086	0.041	0.102	0.099	0.099	0.099	0.099	0.099

	0.099	0.115	0.115	0.115	0.115	0.099	0.088	0.084	0.091
	0.087	0.089	0.089	0.089	0.089	0.089	0.089	0.089	0.089
	0.077	0.089	0.086	0.086	0.094	0.089	0.094	0.094	0.089
	0.084	0.084	0.093	0.088	0.088	0.089	0.088	0.088	0.088
	0.088	0.088	0.088	0.088	0.083	0.083	0.083	0.071	0.086
	0.096	0.091	0.081	0.071	0.071	0.086	0.081	0.076	0.076
	0.071	0.071	0.076	0.078	0.073	0.073	0.109	0.089	0.078
	0.073	0.072	0.067	0.078	0.078	0.078	0.022	0.084	0.090
	0.084	0.084	0.084	0.084	0.036	0.084	0.085	0.085	0.085
	0.085	0.085	0.085	0.085	0.086	0.086	0.086	0.086	0.086
	0.093	0.093	0.086	0.086	0.109	0.109	0.109	0.132	0.144
	0.094	0.082	0.077	0.082	0.082	0.082	0.082	0.079	0.084
	0.125	0.135	0.116	0.093	0.079	0.070	0.087	0.087	0.087
	0.081	0.076	0.076	0.078	0.078	0.078	0.078	0.078	0.078
	0.084	0.062	0.062	0.062	0.062	0.062	0.074	0.115	0.106
	0.069	0.065	0.055	0.069	0.058	0.058	0.019	0.019	0.019
	0.019	0.019	0.233	0.152	0.050	0.089	0.081	0.077	0.077
	0.077	0.077	0.077	0.077	0.077	0.091	0.144	0.091	0.091
	0.099	0.099	0.099	0.099	0.099	0.044	0.219	0.591	0.435
	0.298	0.091	0.050	0.044	0.042	0.035	0.041	0.197	0.088
	0.046	0.129	0.106	0.087	0.076	0.076	0.076	0.076	0.090
ALG	8760	1							
	0.	0.							
ALG2	8760	1							
	0.	0.							
ALG3	8760	1							
	0.	0.							
T282ALK	336	3							
	174.640	174.960	175.460	175.960	174.640	173.320	169.800	172.160	253.120
	265.200	263.840	183.600	183.600	173.160	184.760	192.520	178.120	181.600
	187.120	183.120	185.600	185.	185.	185.			
T282DOC	336	3							
	0.348	0.920	0.900	0.780	0.648	0.416	0.716	0.496	0.380
	0.600	1.320	0.596	0.896	0.564	1.684	0.628	1.892	0.416
	0.432	0.952	0.616	.6	.6	.6			
T282NH4	336	3							
	0.013	0.007	0.005	0.003	0.007	0.010	0.007	0.033	0.020
	0.004	0.010	0.010	0.000	0.028	0.008	0.020	0.020	0.008
	0.000	0.056	0.000						
T282NO3	336	3							
	1.916	1.869	1.771	1.673	1.610	1.546	1.611	1.674	1.532
	1.509	1.416	1.458	1.442	0.748	1.618	1.535	1.748	1.580
	1.475	1.484	1.604	1.6	1.6	1.6			
WQ1 DUMY	8760	1							
	0.	0.							
T282COLI	336	3							
	12.040	5.908	5.732	5.472	2.808	0.144	0.080	0.420	16.712
	32.920	160.680	91.720	106.400	137.400	161.720	176.000	190.840	276.680
	89.000	82.560	76.120	76.	76.	76.			
DET	8760	1							
	2.	2.							
T282DO	168	6							
	13.424	12.464	12.848	13.080	12.708	12.840	12.956	13.020	13.152
	12.684	12.704	12.236	11.768	11.636	12.680	12.144	11.928	12.048
	10.992	12.000	11.928	12.280	10.768	10.432	10.264	9.260	9.248
	9.648	9.612	8.888	10.096	10.908	8.428	8.056	10.288	9.560
	9.404	9.464	9.456	9.424	8.804	9.	9.	9.	9.
	9.	9.							
T282SRP	336	36							
	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008

	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
	0.008	0.008	0.008	0.009	0.009	0.009	0.009	0.009	0.009
	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.010
	0.010	0.010	0.010	0.009	0.009	0.009	0.012	0.014	0.029
	0.050	0.050	0.041	0.070	0.077	0.318	0.447	0.216	0.041
	0.020	0.050	0.031	0.019	0.015	0.013	0.014	0.014	0.014
	0.014	0.014	0.014	0.014	0.048	0.093	0.065	0.029	0.022
	0.024	0.024	0.016	0.015	0.009	0.009	0.007	0.007	0.007
	0.007	0.010	0.010	0.017	0.017	0.024	0.034	0.044	0.026
	0.009	0.061	0.024	0.007	0.011	0.009	0.032	0.025	0.015
	0.011	0.024	0.013	0.013	0.012	0.012	0.012	0.012	0.012
	0.012	0.012	0.012	0.012	0.012	0.011	0.011	0.010	0.011
	0.010	0.010	0.010	0.012	0.012	0.011	0.011	0.010	0.010
	0.009	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	0.009	0.009	0.010	0.010	0.010	0.009	0.010	0.010	0.010
	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.008	0.009
	0.010	0.010	0.009	0.008	0.008	0.009	0.009	0.009	0.009
	0.008	0.008	0.009	0.009	0.008	0.008	0.011	0.010	0.009
	0.008	0.008	0.008	0.008	0.008	0.008	0.005	0.009	0.009
	0.009	0.009	0.009	0.009	0.006	0.009	0.009	0.009	0.009
	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.012	0.013
	0.009	0.009	0.008	0.009	0.009	0.009	0.009	0.009	0.010
	0.013	0.014	0.012	0.011	0.009	0.008	0.009	0.009	0.009
	0.009	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
	0.009	0.009	0.009	0.009	0.009	0.009	0.010	0.013	0.014
	0.010	0.010	0.009	0.010	0.009	0.009	0.009	0.009	0.009
	0.009	0.009	0.076	0.051	0.019	0.011	0.011	0.010	0.010
	0.010	0.010	0.010	0.010	0.010	0.004	0.015	0.004	0.004
	0.004	0.004	0.004	0.004	0.004	0.007	0.077	0.203	0.150
	0.104	0.004	0.018	0.017	0.016	0.014	0.016	0.063	0.030
	0.008	0.015	0.013	0.011	0.010	0.010	0.010	0.010	0.004
T282SI	336	3							
	12.666	13.821	13.436	13.194	9.534	5.872	6.698	12.462	12.275
	12.079	11.484	11.759	12.022	12.838	13.593	13.358	14.025	12.219
	13.840	13.272	13.536	13.	13.	13.			
TEMP	24	36							
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
	8.25	9.12	9.12	10.43	11.30	10.43	10.43	9.12	8.25
	9.12	9.99	9.99	9.99	9.99	10.43	9.99	9.99	9.99
	9.99	9.99	10.43	10.43	10.43	15.21	12.16	12.60	10.43
	13.03	15.65	11.30	10.86	15.65	17.82	15.65	11.30	10.86
	16.52	11.30	10.86	10.43	9.99	10.86	11.20	12.16	13.47
	13.90	13.90	13.03	13.03	12.60	12.60	12.16	12.16	12.16
	12.60	12.16	14.34	13.03	12.16	13.47	13.47	13.90	13.47
	11.73	12.60	12.60	13.03	12.60	12.16	12.60	13.47	13.03
	13.47	13.03	14.77	14.34	14.77	16.52	16.08	16.08	15.65
	15.65	18.26	18.26	19.73	21.30	19.56	17.82	17.82	16.52

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            17.39    18.26    16.95    18.69    17.39    17.82    20.43    19.56    18.26
            18.69    17.82    15.65    16.95    17.82    18.26    16.08    15.21    13.90
            13.90    14.77    13.90    13.03    13.03    15.21    14.77    16.52    15.21
            16.08    16.08    15.21    14.77    14.77    14.77    15.21    15.21    15.21
            15.21    15.21    15.21    15.21    15.21    15.21    15.21    14.34    15.65
            15.65    15.65    14.77    15.65    14.77    15.65    16.08    15.65    15.65
            15.21    15.65    16.52    16.08    16.08    16.52    16.52    15.21    15.65
            15.21    11.73     9.99    12.60    14.34    15.65    15.21    15.65    15.65
            16.08    16.08    15.65    16.95    16.52    16.08    15.65    15.65    15.65
            15.65    15.82    17.12    17.56    16.78    15.04    12.69    10.60     9.82
             9.82     9.82     9.65     9.29     9.21     9.90     9.82     8.42     9.03
             9.65     9.29     5.47     5.21     5.73     7.21     7.73     8.34     8.60
             8.25     8.51     8.78     8.34     7.55     8.42     7.99     6.77     4.68
             4.51     5.38     6.34     6.08     5.81     3.38     3.81     3.38     3.38
             3.38     3.38     3.38     3.38     3.38     4.77     5.12     5.21     4.43
             4.34     3.81     3.64     3.38     3.38     3.38     3.38     3.38     3.38
TDS          8760        1
             220.     220.
T282SS        336        3
            4.413    2.034    2.507    2.980    3.140    3.300    2.100    3.420    1.984
            0.464    2.544    2.096    3.092    4.072    0.600    1.092    1.620    0.000
            0.840    3.252    5.680      5.6      5.6      5.6
T282PH        168        6
            8.252    8.352    8.268    7.748    7.916    7.496    7.564    7.732    7.616
            7.784    7.800    7.900    8.084    8.100    8.352    8.268    8.016    8.184
            7.428    8.720    8.368    8.016    7.968    7.900    8.320    8.152    8.504
            8.068    8.152    8.168    8.252    7.768    7.436    8.576    7.800    7.800
            7.984    7.884    7.600    7.852    7.684       7.       7.       7.       7.
               7.       7.
ANATRIB2      336       25
 TRIB2       0.00     0.00     0.00     0.00       .0     5.96       .0
 TRIB2       0.00     0.00     0.20     0.00       .0     6.96       .0
 TRIB2       0.00     0.00     0.20     0.00       .0     5.68       .0
 TRIB2       0.00     0.00     0.22     0.00       .0     5.63       .0
 TRIB2       0.03     0.00     0.10     0.00       .0     5.84       .0
 TRIB2       0.08     0.00     0.00     0.00       .0     5.91       .0
 TRIB2       0.00     0.00     0.50     0.00       .0     6.23       .0
 TRIB2       0.00     0.00     0.10     0.00       .0     6.55       .0
 TRIB2       0.00     0.00     0.00     0.00       .0     7.64       .0
 TRIB2       0.00     0.00     0.10     0.00       .0     9.61       .0
 TRIB2       0.00     0.00     0.00     0.00       .0     8.43       .0
 TRIB2       0.00     0.00     0.10     0.00       .0     8.80       .0
 TRIB2       0.00     0.00     0.10     0.00       .0     9.68       .0
 TRIB2       0.02     0.00     0.18     0.00       .0     7.81       .0
 TRIB2       0.00     0.00     0.10     0.00       .0     9.21       .0
 TRIB2       0.00     0.00     0.08     0.00       .0    10.92       .0
 TRIB2       0.00     0.00     0.10     0.00       .0     9.36       .0
 TRIB2       0.00     0.00     0.10     0.00       .0     8.52       .0
 TRIB2       0.00     0.00     0.10     0.00       .0     9.17       .0
 TRIB2       0.02     0.00     0.00     0.00       .0     9.09       .0
 TRIB2       0.00     0.00     0.00     0.00       .0     6.07       .0
 TRIB2       0.12     0.00     0.10     0.00       .0     6.61       .0
 TRIB2       0.00     0.00     0.12     0.00       .0     5.39       .0
 TRIB2       0.00     0.00     0.10     0.00       .0     6.16       .0
 TRIB2       0.00     0.00     0.00     0.00       .0     5.59       .0
DIAGNOSE99999
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APPENDIX B: INITIAL CONDITIONS, EAU GALLE SIMULATIONS, 1981 AND 1982

Table B1

Initial Conditions Used for 1981 and 1982 Eau Galle Simulations

Variable	Units	Model Acronym	1981	1982
Algae 1	g/m^3	ALGAE(,1)	0	0
Algae 2	g/m^3	ALGAE(,2)	0	0
Algae 3	g/m^3	ALGAE(,3)	2.77	0.33-0.38
Temperature	°C	TEMP	5.8-6.0	6.9-7.1
Alkalinity	g/m^3	ALKA	108.0-110.0	80.0-82.0
Ammonia-N	g/m^3	CNH3	0.033-0.052	0.184 -0.200
Nitrite nitrate-N	g/m^3	CNO2	0.654-0.682	1.14-1.17
Refractory dissolved organics	g/m^3	RFR	13.5-15.3	10.6-12.6
Labile dissolved organics	g/m^3	DOM	5.79-6.54	4.5-5.4
Detritus	g/m^3	DETUS	2.4	2.4
Oxygen	g/m^3	OXY	12.7-13.3	10.3-10.4
Orthophosphate-P	g/m^3	PO4	0.110	0.081-0.083
Total dissolved solids	g/m^3	TDS	157.0-167.0	133.0-153.0
Zooplankton	g/m^3	ZOO	0.1	0.1
pH	DL*	PH	8.0-8.2	7.8
Suspended solids	g/m^3	SSOL	23.4-24.6	11.3-13.3
Sediment	g/m^2	SEDMT	501.0-5001.0	501.0-5001.0
Fish	kg/ha	FISH	55.0	55.0
Oxidized manganese	g/m^3	CMN4	0.1	0
Reduced manganese	g/m^3	CMN2	0.1	0
Oxidized iron	g/m^3	FE3	0.8-1.2	0.5
Reduced iron	g/m^3	FE2	0.1	0
Iron sulfide	g/m^3	FESB	0	0
Sulfate	g/m^3	SO4	7.1-9.3	11.1-12.9
Sulfide	g/m^3	S2	0	0

(Continued)

* DL = dimensionless.

Table B1 (Concluded)

Variable	Units	Model Acronym	1981	1982
Sediment iron	g/m^3	FE	1310.0	1310
Sediment iron sulfide	g/m^3	FESA	0	0
Sediment sulfur	g/m^3	S	1.6	1.6
Sediment orthophosphate-P	g/m^3	XPO4	102.0	102.0
Sediment nitrogen	g/m^3	CN	1210.0	1210.0
Silica	g/m^3	SI	5.52-6.10	0.33-0.38
Coliforms	g/m^3	COLIF	220.0-300.0	111.0

APPENDIX C: COEFFICIENTS FOR EAU GALLE SIMULATIONS, 1981 AND 1982

Table C1

Coefficients Used for 1981 and 1982 Eau Galle Simulations

Description	Units*	Model Acronym	Value
Physical			
Number of outlet ports	DL	NOUTS	1
Number of tributaries	DL	NTRIBS	2
Reservoir latitude	decimal degrees	XLAT	44.8
Reservoir longitude	decimal degrees	XLON	92.3
Radiation turbidity factor	DL	TURB	1.7
Empirical heat flux coefficient	m/mb sec	AA	0
Empirical heat flux coefficient	1/mb	BB	1.2×10^{-9}
Reservoir length	m	RLEN	850.0
Minimum layer thickness	m	SDZMIN	0.4
Maximum layer thickness	m	SDZMAX	1.2
Port elevation	m	ELOUT	4.1
Vertical dimension of port	m	PVDIM	1.08
Horizontal dimension of port	m	PHDIM	1.08
Weir length	m	WRLNG	7.6
Weir height	m	WRHGT	9.75
Empirical weir coefficient	DL	COEF	3.2

(Continued)

* DL = dimensionless.

(Sheet 1 of 12)

Table C1 (Continued)

Description	Units	Model Acronym	Value
Physical (Continued)			
Wind sheltering coefficient	DL	SHELCF	0.007
Penetrative convection fraction	DL	PEFRAC	0.004
Mixing coefficient for wind	DL	CDIFW	0.00009
Mixing coefficient for flow	DL	CDIFF	0.0002
Critical density for inflow	DL	CDENS	2.0
Extinction coefficient	1/m	EXCO	0.8
Radiation absorbed in 0.6 m	fraction	SURFRAC	0.45
Shading coefficient for suspended solids	(1/m) × (mg/ℓ)	EXTINS	0.1
Diffusion coefficient for oxygen	m^2/sec	DMO2	5.4×10^{-10}
Diffusion coefficient for carbon dioxide	$m/^2$sec	DMCO2	7.5×10^{-9}
Suspended solids settling	m/day	TSSETL	0.05
Algae			
Carbon fraction of dry weight	DL	ALGAC	0.46
Nitrogen fraction of dry weight	DL	ALGAN	0.08
Phosphorus fraction of dry weight	DL	ALGAP	0.004
Shading coefficient	(1/m) × (mg/ℓ)	EXTINP	0.38
Fraction of dead algae to detritus	DL	ALDIGO	0.40

(Continued)

(Sheet 2 of 12)

Table C1 (Continued)

Description	Units	Model Acronym	Value
Alga 1			
Maximum production rate	1/day	TPMAX (1)	0.99
Settling rate	m/day	TSETL (1)	0.05
Phosphorus half-saturation	mg/ℓ	PS2PO4 (1)	0.02
Nitrogen half-saturation	mg/ℓ	PS2N (1)	0.06
Carbon half-saturation	mg/ℓ	PS2CO2 (1)	0.10
Light saturation	kcal/m^2/hr	PS2L (1)	85.0
Maximum excretion rate	1/day	TPEXCR (1)	0.05
Maximum mortality rate	1/day	TPMORT (1)	0.07
Maximum respiration rate	1/day	TPRESP (1)	0.14
Temperature multipliers			
Low threshold	°C	ALG1T1	7.0
Low optimum	°C	ALG1T2	15.0
High optimum	°C	ALG1T3	28.0
High threshold	°C	ALG1T4	35.0
Low minimum	DL	ALG1K1	0.1
High minimum	DL	ALG1K4	0.1

(Continued)

(Sheet 3 of 12)

Table C1 (Continued)

Description	Units	Model Acronym	Value
Alga 2			
Maximum production rate	1/day	TPMAX (2)	1.4
Settling rate	m/day	TSETL (2)	0.10
Phosphorus half-saturation	mg/ℓ	PS2PO4 (2)	0.02
Nitrogen half-saturation	mg/ℓ	PS2N (2)	0.09
Carbon half-saturation	mg/ℓ	PS2CO2 (2)	0.1
Light saturation	$kcal/m^2/hr$	PS2L (2)	115.0
Maximum excretion rate	1/day	TPEXCR (2)	0.04
Maximum mortality rate	1/day	TPMORT (2)	0.06
Maximum respiration rate	1/day	TPRESP (2)	0.17
Temperature multipliers			
Low threshold	°C	ALG2T1	12.0
Low optimum	°C	ALG2T2	19.0
High optimum	°C	ALG2T3	25.0
High threshold	°C	ALG2T4	35.0
Low minimum	DL	ALG2K1	0.1
High minimum	DL	ALG2K4	0.1

(Continued)

(Sheet 4 of 12)

Table C1 (Continued)

Description	Units	Model Acronym	Value
Alga 3			
Silica fraction of dry weight	DL	ALGAS	0.34
Silica half-saturation	mg/ℓ	PS2SI	0.05
Maximum production rate	1/day	TPMAX (3)	1.60
Settling rate	m/day	TSETL (3)	0.12
Phosphorus half-saturation	mg/ℓ	PS2PO4 (3)	0.004
Nitrogen half-saturation	mg/ℓ	PS2N (3)	0.07
Carbon half-saturation	mg/ℓ	PS2CO2 (3)	0.08
Light saturation	kcal/m^2/hr	PS2L (3)	45.0
Maximum excretion rate	1/day	TPEXCR (3)	0.04
Maximum mortality rate	1/day	TPMORT (3)	0.010
Maximum respiration rate	1/day	TPRESP (3)	0.145
Temperature multipliers			
Low threshold	°C	ALG3T1	0.0
Low optimum	°C	ALG3T2	8.0
High optimum	°C	ALG3T3	12.0
High threshold	°C	ALG3T4	17.0
Low minimum	DL	ALG3K1	0.1
High minimum	DL	ALG3K4	0.1

(Continued)

(Sheet 5 of 12)

Table C1 (Continued)

Description	Units	Model Acronym	Value
Macrophytes			
Maximum production rate	1/day	TPLMAX	0.42
Maximum respiration rate	1/day	TMRESP	0.05
Maximum excretion rate	1/day	TMEXCR	0.012
Maximum mortality rate	1/day	TMMORT	0.03
Dead plants to dissolved organics	fraction	PLDIGO (1)	0.2
Dead plants to detritus	fraction	PLDIGO (2)	0.4
Dead plants to sediment	fraction	PLDIGO (3)	0.4
Temperature difference for mortality	°C	TMPMAC	1.5
Self shading coefficient	(1/m) × (mg/ℓ)	EXTINM	0.04
Carbon half-saturation	mg/ℓ	PLIMC	0.1
Nitrogen half-saturation	mg/ℓ	PLIMN	0.01
Phosphorus half-saturation	mg/ℓ	PLIMP	0.005
Plant density	g/m^3	PLDENS	40.0
Light saturation	$kcal/m^2/hr$	PLITE	95.0
Nutrient fraction from sediments	fraction	PLFRAC	0.55
Depth with no growth	m	PLNTDEP	1.8
Temperature multipliers			
Low threshold	°C	PLTT1	7.0
Low optimum	°C	PLTT2	21.0

(Continued)

(Sheet 6 of 12)

Table C1 (Continued)

Description	Units	Model Acronym	Value
Macrophytes (Continued)			
High optimum	°C	PLTT3	24.0
High threshold	°C	PLTT4	34.0
Low minimum	DL	PLTK1	0.2
High minimum	DL	PLTK4	0.2
Zooplankton			
Maximum ingestion	1/day	TZMAX	0.99
Maximum mortality	1/day	TZMORT	0.011
Ingestion efficiency	fraction	ZEFFIC	0.65
Preference for alga 1	DL	PREF (1)	0.15
Preference for alga 2	DL	PREF (2)	0.25
Preference for alga 3	DL	PREF (3)	0.30
Preference for detritus	DL	PREF (4)	0.30
Maximum respiration	1/day	TZRESP	0.20
Minimum food concentration	mg/ℓ	ZOOMIN	0.20
Food half-saturation	mg/ℓ	ZS2P	0.5
Temperature multipliers			
Low threshold	°C	ZOOT1	2.0
Low optimum	°C	ZOOT2	12.0

(Continued)

(Sheet 7 of 12)

Table C1 (Continued)

Description	Units	Model Acronym	Value
Zooplankton (Continued)			
High optimum	°C	ZOOT3	26.0
High threshold	°C	ZOOT4	36.0
Low minimum	DL	ZOOK1	0.1
High minimum	DL	ZOOK4	0.1
Fish			
Maximum ingestion	1/day	TFMAX	0.018
Food half-saturation	mg/ℓ	FS2FSH	0.2
Preference for sediment	DL	FPSED	0.03
Preference for alga 1	DL	FPALG (1)	0.15
Preference for alga 2	DL	FPALG (2)	0.15
Preference for alga 3	DL	FPALG (3)	0.15
Preference for zooplankton	DL	FPZOO	0.37
Preference for detritus	DL	FPDET	0.15
Temperature multipliers			
Low threshold	°C	FSH1T1	1.0
Low optimum	°C	FSH1T2	24.4
High optimum	°C	FSH1T3	28.4

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(Sheet 8 of 12)

Table C1 (Continued)

Description	Units	Model Acronym	Value
Fish (Continued)			
High threshold	°C	FSH1T4	35.2
Low minimum	DL	FSH1K1	0.1
High minimum	DL	FSH1K4	0.1
Ingestion efficiency	fraction	FEFFIC	0.8
Maximum mortality	1/day	TFMORT	0.01
Maximum respiration	1/day	TFRESP	0.01
Decay			
Labile dissolved organic matter	1/day	TDOMDK	0.04
Ammonia	1/day	TNH3DK	0.01
Detritus	1/day	TDETDK	0.02
Coliforms	1/day	TCOLDK	1.4
Sediment	1/day	TSEDDK	0.0012
Refractory dissolved organic matter	1/day	TRFRDK	0.001
Labile to refractory organics	1/day	TDOMRF	0.05
Labile fraction of organic matter	DL	DOMCNT	0.3
Nitrite-nitrate denitrification	1/day	TNO2DK	0.07
Temperature multipliers			
Dissolved organic matter low threshold	°C	DOMT1	4.0
Dissolved organic matter optimum	°C	DOMT2	22.0

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(Sheet 9 of 12)

Table C1 (Continued)

Description	Units	Model Acronym	Value
Decay (Continued)			
Low minimum	DL	DOMK1	0.12
Ammonia low threshold	°C	NH3T1	2.0
Ammonia optimum	°C	NH3T2	32.0
Ammonia low minimum	DL	NH3K1	0.1
Nitrite low threshold	°C	NO2T1	2.0
Nitrite optimum	°C	NO2T2	32.0
Nitrite low minimum	DL	NO2K1	0.1
Coliform Q10	DL	Q10COL	1.04
Chemical			
Phosphorus adsorption desorption	1/(mg/ℓ)	ADSRBP	30.0
Solids capacity for phosphorus	mg P/mg solids	ADMAXD	0.0025
Ammonia adsorption-desorption	1/(mg/ℓ)	ADSRBN	40.0
Solids capacity for ammonia	mg N/mg solids	ADMAXN	0.005
Stoichiometric equivalents			
Oxygen - ammonia	DL	O2NH3	4.57
Oxygen - nitrite	DL	O2NO2	1.14
Oxygen - detritus	DL	O2DET	1.4

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(Sheet 10 of 12)

Table C1 (Continued)

Description	Units	Model Acronym	Value
Chemical (Continued)			
Oxygen - biological respiration	DL	O2RESP	1.1
Oxygen - biological production	DL	O2FAC	1.4
Oxygen - dissolved organics	DL	O2DOM	1.4
Oxygen - reduced manganese	DL	O2MN2	0.15
Oxygen - reduced iron	DL	O2FE2	0.14
Oxygen - sulfide	DL	O2S2	2.0
Anaerobic			
Oxygen trigger	mg/ℓ	OXYLIM	0.5
Sediment thickness	cm	SEDTHK	5.0
Particulate manganese settling	m/day	TMN4ST	0.14
Manganese reduction rate	1/day	TMN4RE	0.16
Manganese release rate	$g/m^2/day$	TMNREL	0.35
Manganese oxidation rate	1/day	TMN2OX	0.6
Particulate iron settling	m/day	TFE3ST	0.04
Iron reduction rate	1/day	TFE3RE	0.02
Iron release rate	$g/m^2/day$	TFEREL	0.45
Iron oxidation rate	1/day	TFE2OX	0.6
Sediment iron sulfide oxidation	1/day	TFESAD	0.4

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(Sheet 11 of 12)

Table C1 (Concluded)

Description	Units	Model Acronym	Value
Anerobic (Continued			
Iron sulfide settling	m/day	TFESST	0.5
Iron sulfide oxidation	1/day	TFESBD	0.6
Sulfate reduction	1/day	TSO4RE	0.04
Sulfur release rate	$g/m^2/day$	TSREL	0.01
Sulfide oxidation	1/day	TS2OXI	0.5
Sulfide to iron sulfide reduction	1/day	TS2DK	0.05
Orthophosphate sediment release	$g/m^2/day$	TXP4RE	0.014
Ammonia sediment release	$g/m^2/day$	TCNREL	0.40

(Sheet 12 of 12)

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